Sleepless Plains

Fossilisation and Peasant Kinship in Scandinavia

Halberg, Simon

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LUND
UNIVERSITY

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Abstract:

What does it mean to live with fossil fuels? Studying farmers in the sugar beet districts on the plains of Southern Scandinavia, this thesis investigates the history and ethnography of a troubled relationship between subterranean energy and everyday life. How did it come about that farmers first came to depend on fossil fuels? What changes followed in their use of the land and their gendered division of labour? And in what ways does this history impact contemporary farmers in their views of what constitutes a pretty field? To answer these questions, this thesis proposes an ethnological theory of fossilisation as a total social fact. By doing so, the aim is to explore how fossilisation has shaped an agrarian mode of life and a way of thinking about what one can do with the landscape and with the kinship relations in it. Both landscape and kinship are studied ethnologically as structures which are continually transformed by changes in everyday life over the past 150 years. It is shown how feelings of shame about having weeds in the field and the disappearance of fallow land have historically been tied up with the fossilisation process. Similarly, the emergence of industrial agriculture on the plains testifies to a biographical and metabolic connection to the old sugar plantations in the West Indian colonies which, in complex ways, constituted the blueprint after which domestic agricultural modernity took shape. The impact on the daily lives of farming men and women, children and adults, landowners and the dispossessed is traced through the different waves of fossilisation, after which the current landscape finds itself to be both the victim and driver of a changing climate.

Keywords: Fossilisation, cultural landscapes, peasant kinship, steam ploughs, tractors, dehorsing, sugar beets, weed shame, the myth of the green transition, ethnography and history.

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To the children Vilje, Aksel, Elmer, Jakob, Jens, Albin, Johan Ole, Kamma, Karl and Otto

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Acknowledgements

Studying peasant culture, I have come to look at science much as an agricultural act. When we cultivate certain theories, we cultivate ourselves in particular ways. We grow roots in the tradition, and we pass it on. Outside the strange capitalist society in which we live, how could anyone think that an individual could 'own' an idea or a concept? The fruits of our concepts belong to us all, and the theoretical grounds from which they grew, to nobody. Like agriculture, science is a communal activity which creates bonds across the generational divides, as knowledge about what the world is and our role in it is passed on through generations. One might try to come up with fancy new concepts or an ingenious way of ploughing the field, but if subsequent generations do not accept them into their worldview and their practices, then they fade away and are quickly forgotten.

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Along the way came Lea who understood the project immediately and supported me cleverly during the ups, and more importantly, the downs. You have transformed the text more than you know, and now Karl is transforming all of us.

In kinship and in science, what matters more than production is reproduction. Knowledge is handed down, empowering its current holders in the hope that they might change things a little bit for the better. What scientists cultivate is not food but perspectives on what the world is and what our place in it is. Here is the fruit of my ethnological gardening, for which I am endlessly indebted to all the people mentioned above as well as many others. I hope you will enjoy it and, maybe, even pass on an idea or two to someone else.

Introduction

What follows is an ethnological investigation of a culture which turned its peasants into fossil fuel addicts only to condemn them for it. Empirically, it is a historical account and an ethnographic description of how farmers cultivated sugar beets on the fertile plains of Southern Scandinavia between 1880 and 2025 and how, through this, they cultivated a new form of life for themselves.

Studying some farmers in one corner of the world, this book sets out to understand what it has meant to live with fossil fuels, the goal being to prepare the way for a discussion on what it might mean to live without them. This obviously means entering a political discussion about what the past might teach us about the possible paths we might take in the future. But at this point in the history of the planet, we can no longer afford to pretend that science is not always inscribed in a political context. The heating of this planet demands that we tackle the question head on.

The problem facing Scandinavian farmers is the same problem which confronts all extant humans. Two hundred years of fossil fuel dependence has now proved itself to be the most damaging chapter in the history of humanity. In a remarkably brief period, mankind has become the dominant force on the planet, its economies threatening not only its own foundation, but also the conditions of existence of most other lifeforms. 'In the past', wrote the anthropologist Robin Fox half a century ago,

> it has not mattered greatly what people believed about themselves and their societies, since nothing that followed from these beliefs could have endangered the species. Man is now rapidly approaching the point—and it will come in the lifetimes of his children—when, unless he takes his survival consciously into his own hands, he may not survive as a species. This requires a revolution in thinking as serious as the Copernican revolution. Man has to move to a *species-centred* view of the human world he inhabits. And he has to do it quickly—within the next fifty years or even less (Fox 1975: 295. Emphasis in original).

Now the fifty years have passed, and the science is clear: Time has indeed come to find ways to live within the boundaries and bearing capacities of the planet (Richardson et al. 2023; IPCC 2023; Malm and Carton 2024). After two hundred

years of growing reliance of fossil fuels, it now matters greatly what humans think about themselves and their societies. Ideas about economic growth and relying on established patterns of consumption are now driving industrial peoples further over the edge. And as Fox predicted, the *species-centred* view of humanity has now entered the sciences. Summed up in a single word, the *Anthropocene* describes a new geological epoch of planet Earth in which humanity is the main driving force. In ways unforeseen half a century ago, clear boundaries between the natural world and social world established in Western, scientific Enlightenment thought are being challenged. In the narratives of geologists, cultural devices and passion now appear. This is clear in the work of the atmospheric chemist Paul Crutzen (2002), who originally coined the term the Anthropocene. 'To assign a more specific date to the onset of the "anthropocene"', he and biologist Eugene F. Stoermer wrote when they first launched the concept,

> seems somewhat arbitrary, but we propose the latter part of the 18th century, although we are aware that alternative proposals can be made. However, we choose this date because, during the past two centuries, the global effects of human activities have become clearly noticeable. This is the period when data retrieved from glacial ice cores show the beginning of a growth in the atmosphere of several 'greenhouse gases', in particular CO_2 and CH_4. Such a starting date also coincides with James Watt's invention of the steam engine in 1784 (Crutzen and Stoermer 2000: 17–8).

Here, in a narrative about geological epochs, we have the appearance of steam technology alongside carbon dioxide as the decisive moment when the old Holocene world began to crumble. Since the publication of this landmark contribution, an unwieldy, expansive set of research trajectories have emerged. Under the banner of the Anthropocene, geologists, chemists, historians, anthropologists, biologists, artists, climate activists, indigenous peoples, economists, politicians and many others now find themselves engaged in one and the same discussion about the role and responsibility of humanity in averting the worst catastrophes. The perspectives and passions are many, and no one, it seems, can agree on everything. Contributing to this debate, this investigation aims to explore not only how fossil fuels transformed an agricultural way of life in Scandinavia, but also ways of thinking about what one can do with the landscape and with kinship in it.

Research questions and perspective

In Scandinavia as elsewhere, farmers occupy an 'awkward' (Shanin 1972) position in narratives of modernisation (also Narotzky 2016). On the one hand, their mode of life is seen as more ancestral than industrial and modern ways of life. On the other hand, they are themselves caught up in the processes of modernisation, sometimes in pioneering ways. They are both victims and important drivers of climate change (Lynch et al. 2021; Campbell et al. 2017). To explore these paradoxes, this book asks the following questions.

What practices and modes of life were abandoned when fossil energy was adopted by Scandinavian farmers? How was the transition accomplished? What crucial steps and actions can be detected? What practices and modes of life came as a result? And what were the wider implications for peasant culture?

These questions point to a terrain which is hardly foreign to European ethnology. In fact, the discipline itself was institutionalised just when old peasant culture was disappearing.[1] The role of fossil energy in this process was not a perspective explored much by the first generations of ethnologists. Before climate change rose to become the most central concern, there had been little reason to investigate the impact of these fuels. Under a heating sky, it seems that ethnology is uniquely well-situated to study the history of fossil fuels in the everyday life of farmers who began to burn coal and oil.

[1] To avoid confusion about the terms ethnology, ethnography, anthropology and history, a few remarks are in order. I use them all rather provisionally, leaving final conceptualisations aside. European ethnology is its own distinct university discipline in many Scandinavian countries as well as in some parts of continental Europe, traditionally studying pre-industrial peasant culture. In France, however, ethnology is generally used more broadly as the study of human diversity, also beyond the West. This corresponds largely to what is known in the Anglophone world as social or cultural anthropology. In the United States and in Britain, ethnology does not exist as a separate field of study but instead brings associations to 19th-century-style comparative cultural studies, usually carried out by armchair anthropologists. The term ethnography is less confusing. Among Scandinavian ethnologists, French ethnologist, British social anthropologists, and Scandinavian anthropologists alike, it is used to describe one common aspect of their scientific work: the description of the modes of life of different people. A lack of historical sources among non-literate peoples and a refusal to give into speculations have led many anthropologists (including French ethnologists) to prioritise ethnography over history. This, in turn, has resulted in a convention in anthropological writing, sometimes called 'the ethnographic present', which is criticised for presenting people's lives as existing beyond time (Evans-Pritchard, for example, wrote that 'cattle are a Nuer's most cherished possession' [1940: 18]). For Scandinavian ethnologists, on the contrary, the historical dimension of everyday life has been less speculative, as European peasantries have found themselves living in societies where other people had an interest in describing them for nearly a thousand years, thus producing historical sources. But Scandinavian ethnologists are not historians-in-disguise, for through ethnography, they generate their own empirical material to supplement what they can find in the archive.

Sleepless Plains sets out to remedy this situation by proposing a concept of fossilisation to analyse the recent history of Scandinavian farming. With this concept, I want to pay particular attention to the role played by fossil energy in the reshaping of social life on the plains. It means exploring the energy bases of processes of modernisation, mechanisation, masculinisation, urbanisation or whatever term is typically applied. In doing so, I think we might achieve a fusion between two traditions which until now have been kept apart. On the one hand, there is the long-standing ethnological tradition of studying the structure, evolution and dissolution of old European peasant cultures. On the other, there are more recent developments within Marxism which attuned our attention to the powers of fossil capital.

Two main analytical focuses will follow throughout.

The first half of the investigation focuses on the agricultural landscape as a site of fossilisation throughout the Anthropocene. In the second half, the attention shifts to the fossilisation of kinship structures in that very landscape. The two could, and should, be seen as interrelated. This is a point long shared by both ethnologists and Marxists.[2] On the first page of *The Origin of the Family, Private Property and the State*, for example, Friedrich Engels wrote that:

> According to the materialistic conception, the determining factor in history is, in the final instance, the production and reproduction of the immediate essentials of life. This, again, is of a twofold character. On the one side, the production of the means of existence, of articles of food and clothing, dwellings, and of the tools necessary for that production; on the other side, the production of human beings themselves, the propagation of the species. The social organization under which the people of a particular historical epoch and a particular country live is determined by both kinds of production: by the stage of development of labor on the one hand and of the family on the other (Engels 1972 [1884]: 71–72).

What I propose, then, is to study the fossilisation process as it played out among Scandinavian farmers in the fossil age (ca. 1870 to 2025) as the production of

2 The young Marx and Engels (1988 [1844]: 101) were interested in the natural substratum of kinship relations and the social relations of nature which they considered to be mutually constitutive. Later having read the anthropological work of Lewis Henry Morgan (1877), Engels (1972 [1884]) returned to the dialectics of kinship and economy. This spurred endless controversies throughout the 20th century about the implications and evolution of kinship systems (Campbell 1936; Douglas 1969; Goody 1976; Frykman and Löfgren 1987; Knight 1995, 2008; Maggi 2001; Holden and Mace 2005; Bollig 2009).

things like sugar beet and of people who have certain aesthetic preferences about what the landscape should look like and where they should live in it.

Earlier research on fossilisation

When the Ice Age came to an end and the ice melted away, the flatlands in the Southern part of what is now the Scandinavian peninsula and the islands south of it were left open and rich in nutrients after 100,000 years of glaciers pushing through the landscape. Then began twelve millennia of relatively stable climate in which the level of carbon dioxide in the atmosphere stabilised around 260–280 parts per million (ppm), a period which geologists call the Holocene, meaning 'a recent whole'.

The Holocene then gave way to the Anthropocene, the age when humanity had become the primary geological force. The historical significance of fossil fuels emerged as a focal point for scholars engaged in the social forces driving climate change. The British textile industry was, arguably, the first sector in the world where the shift from renewable to fossil energy was made on a large scale. According to the human ecologist Andreas Malm, who pioneered the study of what we might call the *fossilisation of capitalism*, this very history holds some surprise in store.

Why was it, he asked in *Fossil Capital* (2016), that owners of cotton factories in Manchester decided to switch from renewable energy (the early cotton factories were all powered by water flowing through the rivers) to fossil energy? You might, of course, say that the answer is obvious. Capitalists chose fossil power for the only reason they understood: It was cheaper and more efficient. The problem is that, on closer inspection, this was exactly not the case. Malm showed in his book that around 1825, all cotton capitalists in Manchester began to shift despite coal being more expensive and less efficient. How would a whole class of industrialists begin to act against their own economic interests?

Malm's answer was simple: They did so for political reasons. Despite its price and quality, coal offered the capitalist a production which was not tied to time and space. The rivers ran wherever geology and meteorology led the water, which flowed according to the seasons. Coal could be combusted anywhere and at any time. It was only when the capitalists were faced with a rebelling class of workers protesting the horrible living conditions that coal became the source of energy of choice, because it allowed for a relocation to wherever the solidarity of the working class could more easily be broken, for example, in the slums of Manchester (it was called 'Cottonopolis' at the time), where the misery was so great that other, more willing labourers could always be recruited from the endless sea of orphans and

impoverished adults who had no kinship links to rely on for food, warmth, and solidarity. In that account, the roots of climate change lay in the struggle between workers and capitalists about who controlled time and space. Climate change, from the beginning, was class struggle. To understand fossilisation, we need a social theory.

Who, then, was accountable? For Malm, the influential term the Anthropocene suggested that climate change was the product of human action, implying the culpability of humanity as a whole and homo sapiens as a species. If you happen to be an oil company, this was obviously a mitigating circumstance, because it spread the responsibility very thinly across the whole biological species. Much more historically accurate, therefore, as Malm argued along with the anthropologist Alf Hornborg, was to speak about the Capitalocene (Malm and Hornborg 2014; Haraway 2016: 163). Climate change is a historical fact much more intimately connected with the social forces of capitalism than with human nature.

In making his argument, Malm proposes a little dialectical typology of what forms energy might take when seen from the perspective of a human practice. It may *flow* through the landscape on its own accord like wind and water in a renewable fashion that people cannot really make themselves the masters of. It may be tied to the *muscles* of humans (enslaved or free) or animals, but they have a will and will get tired and might rebel. And then there is the *stock* of energy which was 'a source of energy resting *outside of the landscape*' (Malm 2016: 41. Emphasis in original). 'Brought into' the landscape 'as passive and detached bits and pieces, coal', Malm continued, first coal, and later oil and gas

> could be freely transported and stored in a way that applied neither to water or wind, nor to animals or human beings: the separation of coal from the landscape entailed a unique mobility and storability within it. But considerable amounts of human labour were a prerequisite. Wind and water showed up of their own accord; coal had to be cut, hauled and wound to the surface.
>
> As for the dimension of time, the stock occupied a similar position. It appeared to be standing outside of time. Neither weather fluctuations nor metabolic imperatives influenced the temporality of the stock (2016: 41).

The pioneering research that first *saw fossil fuels*, then, studied them in relation to a changing political economy.

It was only after reading *Fossil Capital* that I was able to formulate the research problem which is the subject of this book. It was as if, to speak with one old

French philosopher, there had been some obstacles in the way of us understanding what fossil fuels meant. Stepping over such obstacles, the philosopher Gaston Bachelard (2002 [1938]: 24) spoke of epistemological breaks, referring to what happens when scientific knowledge replaces ignorance, ideology, or myth.

This epistemic rupture also explains why the present section simultaneously functions as an introduction to the theoretical framework *and* to earlier research. Agricultural history in Scandinavia is a vast research field. It would take another dissertation to account for it appropriately. On the other hand, what we might call *fossil theory* is also at present a large, and rapidly growing, research field.[3] The fossil aspect is largely absent from the former, just as questions about peasant culture are absent from the latter. Faced with two overwhelming research traditions, neither of which satisfactorily speaks to our *problematic*, I have chosen to weave together prior literature and theoretical orientation into one account which sheds light on the aspects most relevant to my research questions.

Eco-Marxism as it was articulated by Andreas Malm (2016, 2016a, 2018), but also by Timothy Mitchell (2013), Matthew Huber (2013, 2022), Kohei Saito (2022) and Imre Szeman (2019), first sensitised many scholars of my generation to the fundamental role played by fossil fuels in recent history. Without these contributions, the present study would not have been possible. While I started from the problem raised by fossil theory, I soon found myself in dialogue with two other research traditions. On the one hand, there is my own disciplinary background in (peasant) ethnology, on the other, the post-colonial tradition. Together, these three strands form the background against which *Sleepless Plains* is written, and it is to all three that I wish to be accountable.

As an ethnologist interested in peasant culture, I was more interested in what the farmers who grew the sugar beets thought and did than in the capitalists running the factory. But on the former, the seminal work on fossil capital was silent.[4] Neither is there, to my knowledge, any 'petro-culture' study of

[3] Alongside the Marxist contributions which often study the origins and history of fossilisation (and which therefore are particularly relevant to the present study), students of 'petro-culture' have produced a long-series of interesting contributions on the contemporary forms of oil-based culture. These studies often start from either literary studies (Barrett and Worden 2014; Wilson et al. 2017) or political economy (2019; Boyer 2019; Mitchell 2013, Hanieh 2024). Others prefer to contextualise oil-culture within the framework of historical epochs (Fossat 2024), speaking either of the *Great Acceleration* from the 1950s onwards (McNeill and Engelke 2016), long histories of energy (Fressoz 2024; Smil 2017) or the *Great Divergence* which set the West off on a unique historical trajectory unlike those of other great empires of the past (Pomeranz 2001).

[4] Although some initial steps in this direction have been taken by Scandinavian writers like Eskil Halberg (2020) and Søren Mau (2023).

agriculture.[5] Of course, the argument could be made that the onset of fossilisation itself brings the old peasant society to an end. If this is the case, students of 'petro-cultures' are justified in placing their analyses among non-farming, industrial peoples.

But the farmers are still around, halfway caught up in a fossilised world (van der Ploeg 2008, 2014). This raises the question: What did stock energy mean for agriculture in Scandinavia? At this point, I revisited much of the classical peasant ethnology which, it seems to me, is well-equipped to answer this question, although it never did. The old ethnologists came tantalisingly close to studying peasant fossilisation, but they stopped short of it. I propose, therefore, to return to the old problem which they used to call 'the dissolution of peasant culture' but this time with fossil fuels in mind (Steensberg 1961).

The postcolonial strand, too, offers challenges which any peasant ethnology must face, particularly, the degree to which global connections, unequal power relations and questions of race came to shape Scandinavian rural life as well as the illusion that what happened in a place like Southern Sweden in 1880 was somehow a local phenomenon. At that time, peasants had already been metabolically tied to sugar plantations in the West Indies for more than a century, as they poured a little sugar into their tea and coffee. The developments in the European sugar beet industry and its associated labour movements across the continent towards the end of the 19th century, as Angela Zimmerman (2010) points out in her transnational history, were not as much a blank slate for industrial modernisation as they were moulded on colonial experiences in the American South and in Africa. Writing on the relations between agriculture and fossil energy, the scholar and activist Vandana Shiva noted that 'Industrial systems of food production use ten times more energy than the ecological agriculture does, and ten times more energy than the energy in the food they produce' (2008: 97). Her work (Shiva 1988, 2008) provides a powerful anticolonial critique of dominant political economies of development as these were conceived of by westerners.

According to anthropologist Anna Tsing, the plantation was the birthplace of modernity because it was there that the model of scalability was first perfected. Enslaved people stolen from Africa as well as sugar cane were 'landscape elements without transformative relationships' (2012: 511). Taken out of their contexts

[5] Apart from Vandana Shiva's *Soil, not oil* (2008), Dale Pfeiffer's *Eating Fossil Fuels* (2006), both of which are good contributions whose orientation is more towards political economy than anthropology, although it does contain a good deal of ethnographic examples, the field of fossil agriculture is surprisingly empty considering that a fourth or even a third of world carbon emissions is estimated to originate from agricultural production (SAPEA 2020: 39).

(cane was a clone with no companion species in the new world, the enslaved had been pulled away from their kin), they were freely manageable in a system which could be scaled up without rethinking the basic elements.[6]

From an ecological perspective, this is little more than a variation on Malm's analysis of how capital became fossil in the textile industry. Malm proposed that British cotton industrialists did not choose to shift from renewable waterpower to coal in the factories of Manchester because it was cheaper or more efficient. On the contrary, steam power was expensive and problematic, but it had one major advantage: Coal had no relations to the landscape. Existing as if frozen in time, it could be moved around freely, stored, and used on demand. Capitalists, Malm argued, weaponised the 'spatiotemporal profile of the stock' in their struggle over who controls time with the workers. If Malm was right in claiming, as contemporary factory managers also did at the time, that what mattered was control over time and space by relying only on factors of production which are abstracted out of fluctuations in time and space or the demands which kinship ties may put on people, then there was no question that a landscape shaped in this picture first emerged in sugar colonies, as Tsing pointed out. Both fossilisation and plantation slavery rested on the same ecological structure.

In a conversation with Anna Tsing and other anthropologists, Donna Haraway argued that the origins of this structure should be considered in the discussion about the implications of the Anthropocene. 'The systematic practice of relocation for extraction is necessary to the plantation system', she said.

> This began prior to the mid-eighteenth-century story of fossil fuels and steam engines and industrial revolution and so on and so forth. All of which is terribly important, God knows! And unfortunately so. But I think that the fundamental revolutions in wording are consequential – so we need to call it the Plantationocene, forget the Capitalocene! (Haraway et al. 2016: 557)

Leaving the most correct naming practice aside here, the two competing and complementary traditions of fossil capital and postcolonialism problematise the old peasant ethnology. But the latter also has something in store for theories of colonialism and fossil capital. In this work, I focus particularly on two

[6] The plantation is a site not only of historical importance, as many of the classical postcolonial accounts point out (James 1938; Mintz 1985; Trouillot 1988), but also of immediate contemporary concern. As the anthropologist Tania Murray Li points out, 'Plantations are back' (2018). The dominance of plantations of palm oil, soybeans and other industrial crops which dominate vast and expanding areas of the Global South shows that ecological flows to the Global North maintain old colonial patterns of domination (also Li and Semedi 2021).

ethnological perspectives which are especially well-situated to complement Malm, Tsing, and their respective research traditions (see above). When the language of the market dominates not only the world but also our analyses of it, the concepts of cultural landscape and kinship relations offer another place from which to see and talk.

If fossil capital and the plantation both work towards creating detached units, freely manageable in an abstract and flat space, studying the local landscape uncovers all the natural and cultural diversity which resist this homogenising movement and which, against all odds, remain out in the land. Similarly, kinship offers a language for analysing all which is still not for sale, and the changing historical obligations people have int relation to their spouses, their children and their parents. By zooming in close on the dynamics of everyday life as people go into the field or bring up children, I joined the ethnological tradition of looking for cracks in the established order (see 'The search for a structural method' below). We will study the plantation to get an idea about what might lie beyond it. It was very much with these questions in mind that I returned to the dormant tradition of peasant ethnology.

Cultural landscapes and peasant kinship

Originally coined by the Swedish ethnologist Carl Wilhelm von Sydow (1934) to describe the way folktales adapted to different environments, the term ecotype was picked up and made famous by the Marxist anthropologist Eric Wolf. In his book with the precise title *Peasants*, he used it to describe the economic foundation of their lives. Following a basic distinction between paleotechnic ecotypes which depended on human and animal power and neotechnic ones which were increasingly relying on fossil fuels and scientific support, he proposed a global typology which can be summed up as follows.

Paleotechnic ecotypes	**Neotechnic ecotypes**
Long-term fallow systems	Specialised horticulture
Sectorial fallow systems	Dairy farming
Short-term fallow system	Mixed farming
Permanent cultivation	Plantations
Permanent cultivation of favoured plots	(Wolf 1966: 19–48).

All agricultural activities in the world may be reduced to one of a quite a few types. It appears that all neolithic forms of life seem to have resorted to only one or two systems out of the around ten known to have existed.

The one Wolf calls mixed farming is particularly relevant for the present purposes. About it, he wrote that,

> *Balanced livestock and cropraising* would be a better designation, in that livestock is raised and fattened for the market, dairy products are occasionally sold, and crops are raised for both consumption and sale. Wheat is grown in more favored areas; rye and oats, or potatoes and sugar beets, in less clement climes (Wolf 1966: 37. Emphasis in original).

It did not take long after Wolf had seized on the concept, before it returned to Scandinavian ethnologists again who began to use it to study regional variation among the preindustrial peasants. In doing so, they drew connections between modes of subsistence and forms of social organisation. Bjarne Stoklund, drawing on Campbell (1936) and Sjöbeck (1928), attempted to divide pre-industrial Danish peasant society into different ecotypes. Besides the peasants of the heath and the marsh, Stoklund (2006: 32) listed two main ideal types.

Forest peasant	**Plains peasant**
One-field system	Three-field system
Mainly cattle	Mainly grains
Villages with side-subsistence	Purely agricultural
Single farms or small villages	Large villages
Informal social organisation	Formalised one
Wide network of contacts	Narrow one
Significant geographical mobility	Poor one
'Entrepreneurial spirit'	Conservatism

Contemporary beet farmers in Scandinavia are the heirs to the tradition in the right column, although many things, as we will see, have changed. Although such approaches did flourish for a while in the 1970s, the ecotype model soon waned under the allegations of geographical determinism. Developing the plains peasants as a fossil ecotype would be to insist that modern farming rests on an ecological foundation every bit as much as any other form ever did, although one would often get the impression from the historiography that fossilisation suspended ecology.

In a pioneering work, the ethnologist Åke Campbell (1936: 36–7) wrote that 'a human group in its treatment of the landscape (settlements, households, etc.) strives for or is driven towards realising its cultural, economic, and political ideas'.

In stratified societies, there are different interests in the landscape. 'The cultural landscape', Campbell continues, 'is then the scene of struggle between different cultural systems' (1936: 28). In the final analysis, the landscape should be studied as such a conflicting whole. Ironically, Campbell studied the different pre-industrial landscape types because industrialisation threatened them, but he never thought to study the industrial landscape.

In Scandinavia, as elsewhere, most land is still owned by private individuals who prefer to keep it in the family. Unlike most other occupations, it is hard, if not outright impossible, to get in if you are not born or adopted into a farming family. In the rural landscape, kinship relations have not yet lost their grip when people's fate is determined (Dackling 2013; Holmlund 2007).

Initially, I was ambivalently sceptical and hesitant whenever the family farm appeared in the ethnographic material. On the one hand, the talk of family farms seemed to me politically suspect. Was this a nostalgic way for a polluting business to cover up as family bliss? On the other hand, however, the case seemed ethnologically appealing: Were we here in the presence of a kinship system which was very different from nuclear families? Perhaps there was some truth to the talk about ancestral lineages, the endless ambitions of recruiting a son or daughter to take over the family farm about which the farmers were concerned.

Kinship studies in ethnology and anthropology has a long, complex and highly politicised history, going back to the realisation by the American business lawyer-turned-anthropologist Lewis Henry Morgan (1871) that the Iroquois people in upstate New York had a system of family life in many ways much more elaborated than the nuclear families with which westerners were familiar.[7] Since then, scholars of kinship have agreed, despite their internal differences, that human kinship can be understood through a contradiction between relations by blood and relations by marriage (Radcliffe-Brown 1941: 2; Lévi-Strauss 1977 [1958]: 50; Fox 1967; Godelier 2011: 77–8). How any given society organises this contradiction reflects where the boundary of the incest taboo is drawn, towards whom one has rights and duties, how a child is made and many other things which help us to paint an ethnological portrait of a culture.

A hundred years ago, Scandinavian ethnologists who were interested in the nature and history of the family usually asked two kinds of questions. Did the old peasant families live in large extended households? And were these inherently

[7] For a review of the scandalous politics attached to Morgan's discoveries and their appropriation by Marx and Engels, the historian of anthropology Marvin Harris (1968: 249) provided a classic account. More recently, the anthropologist Chris Knight (2008) mapped out the long-term consequences in the form of blind spots and tabooed discussions inherited by generations of anthropologists.

patriarchal in nature? One founding father of Swedish ethnology, Sigurd Erixon (1921: 195–6), answered yes to both questions in an article which stood for some decades as the most authoritative account on the matter. Even in cases where the farm was passed on to the daughter, her husband, a stranger and a son-in-law, would nevertheless rule in the house. So, there might be matriliny but still patriarchy, they reckoned.

Half a century later, Börje Hanssen divided the history of Scandinavian peasant kinship into three distinct historical phases. Under feudalism, which in Hanssen's definition lasted until the turn of the 19th century when the peasants became land-owning farmers, what tied people together on the farms was co-residence, not biological kinship relations. Only with agrarian reforms did the peasants enter what Hanssen (1979: 92) called 'the mastery stage' (ca. 1800–1940). When the farm became private property which could be transferred undivided, bloodlines grew in importance and hierarchies based on kinship coalesced in the landscape. With a growing population throughout the 19th century, pressure on the farm's resources grew and the peasant-masters became increasingly aware of class distinctions which divided those who had previously been united in their labour with the land. Even brothers and sisters who could not inherit or marry into a farm found themselves dispossessed (1979: 105–6). It was also in this period that the money economy gradually replaced the old subsistence economy. Lastly, after the Second World War, depopulation reduced rural households, which used to comprise upwards of ten people of three generations of people related by marriage or descent as well as servants, to something that resembled modern nuclear families: a farming man who worked the land and his wife and their children who went away to work and go to school.

Still in the 1970s, 'It never happens that a farm is divided', Hanssen (1979: 115) noted. Another ethnologist, Thomas Højrup, did fieldwork among Danish farmers at the time. He gave the following description of the ideology prevailing within the family farms.

> We in this family bite our teeth and work our way out of the trouble; our family is industrious, self-reliant and in our family, we pass on the family farm (*slægtsgård*, literally 'kin farm') as an exemplary one. In contrast to the old prejudice about the individual person's needs and drive for individual freedom, the analysis of the rural everyday ideologies, which we rank among the most 'freedom-loving', shows that the concept neither springs from biology, psychology nor does it concern the individual human being. We are dealing with a concept, an ideal and a view of humanity, into which the individual

> mirrors and recognises itself, but only by acting within larger units consisting of more individual; where it is doubtful that we can even speak meaningfully about any form of individual freedom. In the rural local community or the rural family business, the freedom of the individual is quite minimal (Højrup 1983: 193. My translation, see language considerations below).

For the farmers, Højrup argued, freedom indeed exists, but it means something other than being free to move wherever, it meant instead retaining the control over the labour process. For them, freedom was still tied up with kinship and the prospects of successful succession of the mode of life itself.

At the time, Højrup (1983) constructed his culturally sensitive 'life-mode analysis' by integrating classical peasant ethnology with historical materialism. In this classical work (Højrup 1983), contemporary farming life-modes were contrasted to other class-specific life-modes (workers, career professionals, investors) by analysing the ideals and ideologies from the perspective of relations of production. Drawing on the 'mode of production approach' developed by Louis Althusser (and Balibar 2009 [1965]), farmers were studied as independent producers of several distinct types, pursuing their own economic and political strategies. In subsequent contributions (Højrup 2003; Nielsen 2004), an epistemological interest in state formation processes added new layers of complexity to the Althusserian starting point. One key finding regarding the organisation of agriculture was that key conditions for a free peasantry were to be found in struggles for sovereignty, not only in economic history (Højrup and Nielsen 2024: 1153–7). In this tradition, family forms are analysed from the dual perspective of mode of production and state interpellation (Højrup and Nielsen 2024: 105–141).

As brilliant as Hanssen and Højrup's articulations of peasant kinship are, they seem to me to be either empirical inductions based on solid archival and ethnographic evidence or analysed as adaptations to economic or political processes over the past centuries (Hanssen 1979; Højrup and Nielsen 2024: 1153–7). But what if the fossilisation of Scandinavian landscapes implies not incremental but fundamental shifts in kinship structures? In that case, we should also be interested in the conceptual structure which corresponds to the family farm.

The family farm might very well be understood as a distinct kinship structure of the kind that the founder of structuralist anthropology, Claude Lévi-Strauss, called a 'house'. In societies with 'houses', instead of land-owning clans, lineages

or dispossessed nuclear families, the house is the dominant institution, and it is defined as

> a corporate body holding an estate made up of both material and immaterial wealth, which perpetuates itself through the transmission of its name, its goods, and its titles down a real or imaginary line, considered legitimate as long as this continuity can express itself in the language of kinship or of affinity and, most often, of both (Lévi-Strauss 1990 [1979]:174).

According to this definition, the Scandinavian family farms certainly are houses.[8] They comprise land, buildings, as well as names and stories, and it seems that the people belong to the farm, rather than the other way around. Among family farmers, selling the farm would be immoral. Through marriage and childbirth, the permanence of the house is sought.

It did not take long before anthropologists picked up Lévi-Strauss' idea and showed that 'house societies' could be found from Indonesia over Amazonia to Norwegian family farmers (Carsten and Hugh-Jones 1995; Howell and Melhuus 2001). Such systems grant great 'freedom to disguise social or political maneuvers under the mantle of kinship' (Lévi-Strauss 1990: 176). In societies with houses, people alternately marry distantly to acquire wealth (symbolic and landed) and closely to keep the property undivided.

> On all levels of social life, from the family to the state, the house is therefore an institutional creation that permits compounding forces which, everywhere else, seem only destined to mutual exclusion because of their contradictory bends. Patrilineal descent and matrilineal descent, filiation and residence, hypergamy and hypogamy, close marriage and distant marriage, heredity and election: all these notions, which usually allow anthropologists to distinguish the various known types of society, are reunited in the house, as if, in the last analysis, the spirit (in the eighteenth-century sense) of this institution expressed an effort to transcend, in all spheres of collective life, theoretically incompatible principles (1990: 184).

[8] But there are also ways of organising agriculture other than the peasant house. Many farmers hire their land, just as corporations are buying up land in many places. The ethnologist Rasmus Blædel Larsen (2016) showed that many other forms of ownership are also viable but there is little doubt that the family farm remains the most important form of agricultural organisation, both in the landscape and in the ruling ideology. It is also the type of social organisation which is the subject of this dissertation.

According to Lévi-Strauss, internal division is exchanged for external unity in the house. It exists in 'a situation where political and economic interests, on the verge of invading the social field, have not yet overstepped the "old ties of blood", as Marx and Engels used to say' (1990: 186). The house unites what is otherwise separate, and spreads what is elsewhere united. 'Thus promoted to second nature, culture offers history a stage worthy of itself'. Both real and imaginary, the house provides for its people 'a starting point endowed with absolute value' (1990: 187).

Already before the house had entered the arsenal of ethnological tools, ethnographers working in Europe had pointed out that kinship among peasants was different from their urban countrymen. Joao Pina-Cabral, for example, made sure to distinguish between the bourgeois *familia* in Portugal and the rural *casa*, literally meaning house. The latter was 'a compound of land, building, animals, people, absent relatives, and even the dead of the household', and it could be used interchangeably with the terms *lar* (hearth) and *fogo* (fire), pointing to the fact that peasant kinship was organised around the fireplace and the food that streams from it (Pina-Cabral 1986: 37–8). 'A profound relationship is held to exist between the members of a household and the fire around which they are united' (1986: 39).

In *The Metamorphoses of Kinship*, the Marxist anthropologist Maurice Godelier (2011: 94–5) draws attention to one aspect of societies with houses which is important for the present purposes, namely, whether they exercise their own sovereignty—as was arguably the case for some important precolonial societies (including the Kwakiutl from whose ethnography Lévi-Strauss drew his primary examples)—or whether they existed within the framework of a state. Seen in this context, Scandinavian family farms clearly belong to the class of house societies in which sovereignty is exercised on houses by a state exterior to them. The free, inheritable landed property among the peasants is, in this part of the world, a relatively modern phenomenon, closely tied to a series of agrarian reforms, stretching from the late 1700s to the early 1900s. During this period, with different speeds and trajectories, feudal relations lost their grip on the landscape almost universally and gave way to private property that was transferred along real or imaginary lines of blood. Højrup and Nielsen even argue that in Scandinavian states, peasant houses were a crucial instrument of the work of sovereignty. 'Despite the celebration of the reforms as an emancipation of the peasantry', they write, 'the reforms were largely initiated from above' (2024: 1171). A historian of the Swedish family farm, Martin Dackling (2013: 177) writes that, contrary to wide-spread assumptions, kinship became more important for Swedish family farmers the more modern, mechanised and indebted they became, despite the

relentless commercialisation which threatened to treat the peasant house as a commodity.

Dackling (2013) joins Hanssen (1979) in asserting that the basic principle of the family farm as a 'house' in Lévi-Strauss' meaning, to keep the land undivided among the kinfolk, has a relatively recent history in Scandinavia. But barely has it been built before it is proclaimed to be ancestral *and* in imminent danger of being destroyed by the modern world (Dackling 2013: 181–3). The fact that it was an invented tradition stripped the house of nothing of its mythical powers for those who grew up in it (also Jenkins 2010: 52).

Although the legal conditions under which farmers seek to perpetuate their estates have changed significantly over the past two hundred years, little has changed in the absolute value they ascribed to their family farms. In Scandinavia as elsewhere, the peasant house has become their second nature. As Højrup and Hanssen stress, farms should be kept undivided and prosperous. Later, Lévi-Strauss confided that, in his own writings, 'he could only draw tentative, rough sketches of his house idea because it came late in his life, so he left it to others to complete the picture' (Hugh-Jones 2001: 959). If the family farm really was a historical object and not just the ideological reflection of something else, it should be possible to reconstruct with some precision how it changed, how the dialectics of descent and alliance shifted as family farmers took up sugar beet cultivation and the peasant house, thus, came under the spell of fossil relations.

Empirical material

To study the fossilisation process among farmers in Southern Scandinavia, I decided to follow the sugar beet. There are several reasons why it is a good crop with which to think about peasant life in the Anthropocene. The first is because it soon became clear that the sugar beet had never been grown without fossil energy (Chapter 2). This still held true in the 2020s when the sugar factories in Denmark were the largest emitter of CO_2, only exceeded by a concrete manufacturer. Secondly, the sugar beet had historically replaced or at least competed with sugar cane, which had a much longer history (Chapter 3). To 'follow the thing' is a classical method in anthropology which is particularly well-suited for the study of global phenomena like capitalism or climate change. Associated with George E. Marcus' (1995) landmark article 'Ethnography in/of the World System', such a 'multi-sited ethnographic approach' arguably has deep roots in ethnology and historical materialism. Karl Marx followed commodities around the world in *Capital* (1976 [1867]), just as Sidney Mintz (1985) tracked the history of (cane) sugar and Bronislaw Malinowski (2005 [1922]) the

circulation of beads and shells in Oceania. In each case, analyses of social life emerge in the wake of the moving thing. Thirdly, the sugar beet and its system of cultivation and processing provided a point of contrast against the dominant narratives of self-organisation among Scandinavian farmers which continued to dominate the historiography (Kjærgaard 1984). Instead of farmer-owned dairy cooperatives, the sugar beet told a story of factories and landscapes as a site where relations between farmers and capitalism materialise.

First, I wanted to know what happened when the steam plough arrived. As it soon turned out, much of the Scandinavian beet sugar industry was the invention of a single man. Gustav Adolph Hagemann was a leading industrialist of his time, and particularly intent on establishing not only sugar factories but a whole infrastructure to supply it with sugar beet. Therefore, he also needed to convince farmers to take up its cultivation. Luckily for this study, he published his visions regularly in what today looks like a propagandistic push for beet sugar (Hagemann 1875, 1885, 1915). Half-technical, half-ideological, this material presents a vision of what the landscape should look like (see Chapter 2, also Halberg 2023).

But if this material was evidence of anything, it was Hagemann's state of mind, not the lay of the land. To get a picture of how the land was used before and after the arrival of the first coal on Scandinavian soils, I turned to historical archives. Particularly, I found the Danish Sugar Factory's own archive valuable (see Table 1 below). There, the tasks of consultants and field plans had been documented. From it, I have tried to reconstruct how the switch to fossil energy transformed the landscape. One remarkable feature of this material is how similar it was in logic and argumentation to the discourse of industrialists in the sugar industry and beyond 150 years later. From an ideological point of view, little seems to have changed.

Before Hagemann developed the conditions for modern fossil farming in Scandinavia, he had done the same in the Danish colonies in the West Indies. And in his publications, he freely compared sugar cane with sugar beet, the plantation and the manor at home. I took this as validation of a connection on a deeper level between plantation agriculture and fossil agriculture which I had already begun to suspect at a conceptual level. Hagemann's biography, in a word, provided ample examples to demonstrate the global connections that make up modern farming as it did for the sugar plantations before. Chapter 3 is devoted to this story.

There are certain limits to what we can learn from such archives. As theoreticians of the archive have pointed out, there is nothing natural or neutral about which aspects of social life end up being recorded. The historian's work is

always dependent on an archive produced for other purposes than historical study. Jacques Derrida (1996: 9–11) noted that the etymological root of the word archive means both 'commencement' and 'command'. To archive is to begin a hierarchy. The events that were important to those who built the archive end up in it. All the rest seeps into silence.

To track the historical arrival of fossil fuels, however, what the industrialists had chosen to record was not entirely satisfactory. Surely, it did provide some concrete detail bordering on ethnographic quality. But it remained bound to those—largely technical issues—which mattered to the fossilisers. What seemed to be more absent, for obvious reasons, was how the change affected agricultural life for the peasants and others more widely.

Another source of situated knowledge about the transformation of the plains was found at the ethnological archive at the National Museum of Denmark in Copenhagen and the Folklife Archive in Lund, comprising written testimonies, or sometimes transcripts of interviews, with informants. Beginning in the middle of the 20th century, ethnologists at these institutions began collecting stories about things that were done before industrialisation among the rural population. The records contained testimonies of all the things that would never find their way to a conventional archive: How did they plough the fields? What happened at Christmas in your hometown in 1880? How do you bake bread?

Testimonies in these archives have provided a wealth of ethnographic knowledge on which I draw in the following (particularly NEU surveys 12, 13 and 14, as well as LUF survey 9, 12 and 189). These contain many important statements on the landscapes of the past, on sugar beets and glimpses of historical family structures. Among the thousands of pages of testimonies that I flipped through, one struck me with special force. An informant called Jens Madsen wrote in unimaginable detail about how the fields were cultivated and how farm work was divided between the people. He wrote about the arrival of sugar beet with precision so nuanced that it spoke directly to my research questions, although he died half a century ago.

One day in November 2023, having visited the Folklife Archive a few times in my search for material that could shed light on the hidden cultural implications of fossilisation, the idea struck me. Instead of only searching broader and wider in the hope of finding other informants like Jens Madsen, why not ask to see whether he himself had written more than the one account about which I had been so enthused. If, I thought, he had an eye and a memory of exactly the kind which ethnologists find so useful, perhaps he had written more. Maybe Ole Højrup, the corresponding ethnologist in the 1950s and '60s, had felt as strongly as I did that

here was a particularly gifted informant, and had taken measures to hear more from him. I asked the curator at the museum whether it was possible to track down informants and not only topics and parishes (the two axes of classification).

That was no problem, she told me. It only took her a few minutes to find the list of his contribution, and it was—exactly as I had hoped—a long, long one. Sheet after sheet noted the exchanges between Jens Madsen and the museum. The relationship went on for fifteen years. This convinced me that Ole Højrup too had found him a valuable informant. The old material collected from around 1930 until around 1980 was, overwhelmingly, concerned with peasant culture. The questions themselves bore the invisible stamp of the theoretical research passions of ethnologists of the time (Hagström and Sjöholm 2005: 139).

Although I have relied quite a bit on Jens Madsen's testimonies in the following (particularly Chapter 2 and 4), comparative material from Sweden and Denmark is also used extensively in Chapter 1, 2, 4 and 5 (primarily NEU surveys 12, 13 and 14) and in Sweden (LUF surveys 9, 12 and 189). This material will never be representative of Sweden, Denmark, Scandinavia or Europe as a whole because there are so many ethnographic variations on the local, regional and national levels that any kind of archetypical thinking soon breaks down (cf. Hagström and Sjöholm 2017: 139). But since all the surveys were drawn from areas where sugar beet was cultivated, some recurrent patterns did emerge, for example about the reliance on migrant labour, attitudes to marriage and who eats with whom.

The advantage of this material is that it often provides a rather rich description of everyday life as remembered by older informants, who give us a view into people's 'thoughts and wonderings, dreams, ideas, values, norms, attitudes, concerns and hopes' (2017: 138). Like many other ethnologists, I have found it necessary to complement the folklife material with a variety of other sources: Newspapers, censuses and the occasional court ruling have been consulted. Together, by means of triangulation, these historical materials have made it possible to reconstruct at least some of the important dimensions of peasant life and kinship as it was first fossilised in Scandinavia.

After having worked with this historical material for some years, I felt I had the historical basis covered sufficiently to do some fieldwork. Above all, I was interested in how the farmers currently experienced the landscape and their own history. Around 2023 and 2024, I visited ten farmers who were kind enough to sit down and talk to me and show me around their farms. With five of them, I conducted semi-structured interviews for one or two hours, usually at the dining table over a cup of coffee. These encounters were important to me in several ways.

For one thing, it was clear that the farmers were themselves well-versed in agricultural history. For them, it was a lived experience with different crops, techniques, machines, and having all been raised in farming families; they related to these historical changes through the lens of kinship. Recordings of these conversations, then, constitute material of a different kind than archival records. They are, the ethnologist Emma Eleonorasdotter points out, the 'product of an interpersonal encounter' (2024: 20). Living people may resist in ways documents cannot. An ethnological interview, contrary to many other forms of communication, tries to capture exactly this aspect of intersubjectivity. One must approach the informants with humility, a readiness to change one's own assumptions, and attentiveness to the cultural context, among other things (Trundle et al. 2024). For each new interview, therefore, I drew up a new list of questions, because it was often the case that each encounter (and the subsequent listening to the recording) gave rise to new problems and angles to address. For my own part, these conversations made me much more sympathetic to the impossible situations these farmers found themselves in.

Although some of this material turned out to be of little analytical value for my fossilisation narrative, all of them helped establish a deeper and wider view of the historical context and the problems involved in sugar production. Some sources have been left out for the sake of brevity. Materials generated in the project (observations, fieldnotes and recordings of interviews) are now stored at the Folklife Archive in Lund, where they can be consulted upon request (Accession number M28569).

A final note regards source criticism. How representative are the interviews, the tradition material from the Folklife Archive, historical records and past publications? The empirical material on which I have based my investigation of the fossilisation of Scandinavian landscapes and kinship systems is limited. With it, I make no claim to have exhausted all the possible sources, nor do I pretend that it provides a full picture. Much of the material seems to concern rather mundane activities concerning how people wanted a landscape to look, how they pulled up a sugar beet in October 1895, or what memories of horses lingered long after the animals had disappeared. In my view, the material only has answers for us that are as good as the questions we ask. To ask questions about how fossilisation took place means looking for common structural traits in the material. Like ethnologists before me (Frykman 1977: 20), I have been on the lookout for patterns. Having consulted and analysed all the material summed up in Table 1 above, I trust that the findings are widespread, common and significant, even if they can never be the final word on the topic of fossilisation.

	Total	Background		Used in analysis	
Type of source		*Danish*	*Swedish*	*Danish*	*Swedish*
Publications	14*	5	1	6	2
Historical archives	45†	32	10	3	
Folklife testimonies	137‡	27	92	8	10
Observations	3			2	1
Interviews	10	1	4	4	1
Total	209	51	107	23	14

Table 1. This breakdown of empirical material into numbers hides the fact that individual sources vary tremendously in size. Publications ranged from pamphlets to long books. One historical archive represents one box of material as organised at the archival institution and may contain many hundreds of pages of information. The testimonies range from a few pages up to around 80 for the longest one, with an average between ten and forty. Observations took place over a few hours. The interviews, conducted at the farms, were between one and three hours in length.

* *Ugeskrift for landmænd* (1872); *St. Croix Agricultural Reporter; Den Tekniske Forenings Tidsskrift* 18–77–8; Wulff (1874); Kristerson (2001); Frederiksen (1892) Hagemann (1875, 1876, 1885, 1915); *Høiesteretstidende* (1882); Andersson (1985); Wohlin (1910); Frandsen (2023).

† Mainly: Cadastral map for Højbygård Hgd., Tågerup (0481652) 1862–1883. Geodatastyrelsen. Map for Højbygård Hgd., Tågerup (0481652) 1883–1988. Geodatastyrelsen: Topographical Map (målebordsblad), Holeby sheet number 4623, published 1908. Geodatastyrelsen; Säbyholms sockerbruks och Teckomatorps saftstations arkiv: Böcker över betleveranser (1894–1901): G3A:1. Landsarkivet, Lund; Skånska Sockerbolags AB:s arkiv: Gödsel och skörderapporter (1854–1871; 1872–1896): G5 HF 1 & 2. Landsarkivet, Lund.; Nakskov Sukkerfabrik: Register vedr. deklarationer, kontrakter, skøder m.m. (1882–1960) 104: 1882 – 1901. Rigsarkivet, København; De Danske Sukkerfabrikker (Højbygaard): Avlsgårdenes roemarker (1882–1934) 214: 1882–1934. Rigsarkivet, København; Brevkopibøger vedr. bogholderi og fakturering, St. Croix (1908–1917), A/S De Danske Sukkerfabrikker (1903–1922, no 283 and 284), Rigsarkivet (Denmark); A/S De Dansker Sukkerfabrikker (10 boxes), Erhvervsarkivet (Denmark).

‡ At the National Museum of Denmark (NEU), I consulted 17,392; 11,791; 30,175; 14,983; 12,280; 33,125; 13,782; 10,196; 10,195; 85.91; 10,219; 6,999; 24,451; 81,73; 21,671; 21,559; 14,727; 17,495; 17,164; 25,522; 18,998; 14,438; 30,175; 13,782; 33,125; 17,392; and 14,983 and I analysed 14,726; 21,681; 23,848; 25,522; 21,408; 12,280; 14,983; 14,438. At the Folklife Archive in Lund (LUF), I consulted M12059; M8643; M8575; M12144; M10235;M14114;M10525; M12101; M13496; M12600; M10772; M4408; M10753; M10369; M11111; M33; M15485; M14104; M11877; M11880; M12105; the sixty testimonies numbered M21279–21,539; M21613; M21923; M22559; 22698; M 22700; M 23510; M1834; 2961; M4327, and analysed LUF 21298; M9641; M28569; LUF M21320; LUF; M21325; LUF M 21291, as well as EU 27061; EU 31934; EU 34524; and FAL12,101. Many more were reviewed cursorily at NEU and LUF.

Ethical and language considerations

Although the topics addressed in my interviews were not sensitive according to any of the existing regulations on research ethics, there are still ethical dimensions to this research. The farmers shared their stories and perspectives with a stranger who took this information out of the face-to-face situation and turned into research data. From this point on, they lost control over the narrative. Now that I have organised and analysed the material, they are at my mercy. To pick out a few quotes from an hour-long conversation and place it in a context which may be totally foreign to them. Nevertheless, they provide a unique way for the ethnologist to learn about all the things that people constructing archives generally find it relevant to preserve.

While one aspect of ethnographic work is to listen to and understand people, this is not everything. What follows, therefore, is not an amplified version of their worldview. It is my analysis of their worldview in relation to many circumstances which they would probably not point to. They cultivate the land, and I was researching the history of this cultivation. It is hard to see how ethnographic research could be different, and there is nothing in this text I would not have told them about had they asked me.

My interviews began when I formally told the farmers about my research project and the protection of their data. I informed them about my project on the history of sugar beet cultivation. Then, I handed them an information letter describing my intention in greater detail. Most seemed to appreciate the information. I told them that their data would be stored and processed in accordance with the guidelines of Lund's University, and that they could, at any time before publication, withdraw from the research project by informing me orally or in writing if they wished to do so.

The farmers are not a marginalised or vulnerable group. Instead, they appeared to me to be proud, self-aware and happy to share their views on the landscape, each other and their family histories. Nevertheless, I have taken several measures to protect their identities. While still in the field, I was careful to minimise the generation of data about them. This meant keeping the recordings as short and concise as possible (although this is something of a paradox for ethnographic research). I also made sure not to ask them questions of a sensitive nature which, according to both the European GDPR regulation and the Swedish guidelines on research ethics, include personal data which disclose ethnic origin, political opinions, religious or philosophical orientation, and union membership. Neither does the material contain information relating to genetic data, biometrics, health status, sexual orientation, income statements or crimes.

When treated in the following, the farmers have been given pseudonyms, and traits which would make them directly identifiable have been left out. Certain names of people and places, too, have been changed. This is the case for all contemporary informants and even some historical figures. The ethnological archives in Denmark are not public records but the property of the National Museum. According to their most recent guidelines, even informants long dead should now be presented with pseudonyms to protect the identity of potential heirs. One consequence of this has been that other public records which I have used to triangulate information about key informants cannot be referenced fully here, because that would give away the identity of some now long-deceased informants. Such safeguards have not yet been taken by the Folklife Archive in Lund, where references to the relevant (Danish) censuses can be accessed (Accession number M 28569).

Most of the empirical material for this study is originally in either Danish or Swedish, but is presented here in my English translation. With translation comes a certain responsibility which is as relevant for historical analysis as for ethnography. Some sources (like Hagemann 1875, 1885) were written in a style characteristic of 19th century public figures who wanted to appear persuasive, argumentative and enlightened. In translating these, I have attempted to keep the style close to the original to capture the tone of the argument. But when it comes to the colonial issues (addressed in Chapter 3), there is one further problem which needs addressing. Like all white people writing about the sugar colony of St. Croix, Hagemann spoke of the Black workers as *negrene* (plural). To translate this term into English is obviously tricky, as it means tackling a tension between historical accuracy and contemporary sensibilities.

In choosing between these alternatives, there is no solution without problems. The mildest translation (*neger* as 'Black') might contribute to the illusion that Scandinavians were somehow more humane colonisers than other Europeans in the Caribbean. Using the most derogatory translation might project conceptual nuances from an Anglophone context onto a Scandinavian one where it did not exist, for better or for worse, as the one term, *neger,* seems to be one term, encompassing the whole spectrum of sentiments expressed in English by 'Black', 'negro', and so on. The term was quite commonplace until rather recently, and the casual way it was used could justify translating *neger* (singular) as either 'Black', 'negro' or something worse. It was used by colonial lords, by industrialists, local elites but also by union leaders in Denmark who sympathised with the Black workers. For this reason, I have chosen to use 'Black' as a translation for *neger* in the following. Hopefully, the readers will be able to judge from the context what

ideas are contained in that word, because I do not mean it as a slight to the history of colonial violence.

Another issue concerns my use of the term 'peasant', which is by no means unambiguous. Contrary to the British use, the Scandinavian term *bonde* does not only connote commoners under medieval domination. The etymology of *bonde* is derived from the verb *bo* which means 'to live'. A peasant, in this context, might imply that one still is bound to the land. In the ethnological literature, the distinction between farmer and peasant might suggest any number of differences, depending on the context of any given study. In a seminal paper, the anthropological peasant specialist Eric Wolf writes that,

> We may thus draw a line between the peasant and another agricultural type whom we call the 'farmer'. The farmer views agriculture as a business enterprise. He begins his operations with a sum of money which he invests in a farm. The crops produced are sold not only to provide goods and services for the farm operator but to permit amortization and expansion of his business. The aim of the peasant is subsistence. The aim of the farmer is reinvestment (Wolf 1955: 545).

Although *bonde* may also be used derogatively, the term can also be used proudly because it implies a cultural depth in relations to kinfolk and the landscape which the term 'farmer' hardly carries (see also Chapter 5). In this thesis, the term peasant means someone who ploughs, reaps and lives a farming form of life.

Having done the bulk of my historical research when I came to interview the farmers, we had a world of common references between us. Rumours of weed shame, news about the sugar factory, the history of tractors and so on all helped to close the obvious gap between us: They were rural, and I was urban, and we all knew that this meant prejudices on both sides. With the Danish farmers, we could speak fluently, while my Swedish interlocutors had to receive my questions in a hybrid language devised for the occasion. This meant that the Swedish fieldwork felt more exotic than the Danish one. There are advantages to working in both contexts.

The closer to home one works ethnographically, the more fluently the language runs, and the easier the transfer of information becomes. But, even when working in my mother tongue, there are challenges. It is, for example, an old ethnological insight that basic words may imply significantly different things for people sharing the same language. It all depends on the cultural context, which often has less to do with linguistic boundaries than with people's mode of life. In

this sense, what a Swedish farmer might think about freedom probably looks a whole lot more similar to what a Danish farmer thinks than some middle-class academic, an ethnologist for example, might initially think. On top of this comes the ethnographic challenges of home-blindness, which make it difficult to see anything at all if you are too close to home.

It is in this context that there is an inherent analytical value in being an outsider. There is in one sense an epistemological privilege in questioning why things are done in this way, because most people accustomed to doing things one way or the other stop questioning it unless they have some special reason to do so. As an example of this dynamic, the anthropologist Marianne Lien points out that where the language of fieldwork is different from the language of analysis—as is the case here—we are faced with a situation open for analysis. 'Consider, for instance, how terms like *mana, hau,* and *potlatch*', she writes, 'have expanded European anthropologists' imaginaries of what human worlds may consist of and of the kinds of worldings that are possible' (2015: 21. Emphasis in original).

The search for a structural method

As mentioned, I came to the existing literature and the empirical material with a simple question in mind: How did we end up in a situation where agriculture had become so intensely dependent on fossil fuels that few—and seemingly fewer farmers—could imagine a life without them? To ask this question means to reverse what has traditionally been meant by fossilisation. For natural scientists, fossilisation means the petrification of biological material under great pressure. For archaeologists and paleoanthropologists, fossilisation is the process which preserves traces of life in the past for study in the present. Interestingly, coal, natural gas and oil are fossil fuels, but they are usually not considered the products of natural fossilisation, because the living biological material of which they are made leaves no trace. Some authors have spoken of fossil fuels instead as 'buried sunlight' (Mitchell 2013: 12) or 'a subterranean forest' (Sieferle 2010 [1982]). For some ethnologists, fossilisation has meant the cultural process by which social artifacts (a typewriter, a landline telephone) lose their connection to everyday practices and become obsolete and antiquarian, social fossils. According to Elizabeth Shove and Mika Pantzar, for example, 'sociopalaeontologists of the future need to specify how routines and habits (life forms) disappear' (2005: 62).

In the following, I take fossilisation to mean how routines, habits and modes of life came to depend on fossil energy. In this light, we are dealing with a long historical process, a kind of silent revolution; revolutionary because it marked a profound ecological and political shift from social metabolic relations that were,

essentially, renewable to ones that consistently displaced carbon from the bowels of the Earth and released it into the atmosphere. But it was also a silent process, a kind of unnoticed revolution of our social arrangements, which promoted fossilisation deeper and deeper until almost all aspects of our lives had been soaked in fossil fuels—at which point it was becoming increasingly difficult to imagine life without them.

It has been said that the old ethnologists walked backwards into modernity, looking back at the pre-industrial past with interest but no remorse because they had great faith in progress. When I revisit their traditional object (peasant culture and its dissolution) of study in the light of the Anthropocene, a certain scepticism about fossil modernity is unavoidable. Despite these changes, ethnologists are still moving through time in the original manner. Now that time has come to move out of fossilism, like earlier ethnologists, I say, we too must look backwards to move forward.

The plough serves as an illustration of the kind of transformation analysis I have in mind. Having been the most important agricultural implement for centuries, the very tool which opened the soil for cultivation, it was always drawn by animal power. First oxen, and since by horses, the energy needed to clear the soil was always drawn locally from the oats and grasses they ate. During the last third of the 19th century, the first fossil alternative emerged in Scandinavia: Strange monstrosities called steam ploughs were bought from England and used to turn the soils. Consuming coal, they were the first example of fossil ploughing. They were largely restricted to the sugar districts, and there only to the largest manorial estates. Only after the Second World War did fossil ploughing become ubiquitous with the arrival of tractors to farms of any size. By studying the plough, I was drawing nearer to the once dominant, now marginalised (if not forgotten), ethnological tradition of studying the emergence and implications of new technologies in agrarian contexts (e.g., Steensberg 1961; Svensson 1961), but now with a focus on the power source fuelling the tool.

In *Sleepless Plains*, we will study this process as what the great anthropologist Marcel Mauss (2016 [1925]: 193) called a 'total social fact'. Fossilisation will be seen as something legal, ethical, economic, political, private, public, implicated in kinship. Its etymological root was in the Latin word fossilis which meant 'dug up', itself deriving from *fodere*, 'to dig'. It was not so much the innate quality of these energy forms but the act of digging them up and setting them on fire that make these fuels fossil. This, the digging—and the subsequent burning—was, following Mauss (2016 [1925]: 119–20), a mythological act which also served to bring many kinds of people together in friendship or conflict.

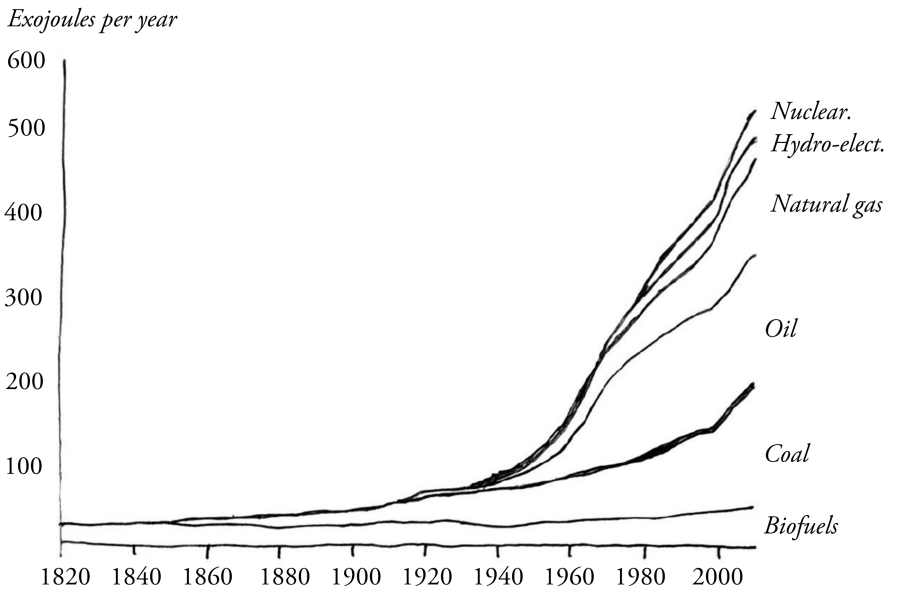

Figure 1. World energy consumption since 1820. Such a view of the energy basis of history can constitute the starting point for a materialist reading of the impact of fossil fuels on all aspects of life in practically all the world's geographies over the past 200 years. Graphs such as these challenge recent innovations, but they should also sensitise us to forms of life which existed without burning coal, gas and oil; a task for ethnography and history, see Table 2 below. Redrawn by the author from Eriksen (2015: 34).

The question is whether there is an underlying structure beneath the fossilisation of the plough and all the other aspects of social life (Table 2 below). Malm (2016), as we have seen, already went some way in uncovering some features of such a structure, most notably the 'spatio-temporal profile' which allowed some people to instrumentalise fossil fuels against others. But once weaponised, the strength uncovered its own weaknesses (cf. Mitchell 2013). Once we begin to draw up a structural theory of fossilisation, we also begin to ask what other ways of organising social life one might learn about in the historical and ethnographic records.

	Upswing years	*Downsw. years*	*Technologies*	*Materials and sectors*	*Fossilisation of what*	*CO_2 (ppms)*
1st wave	1780–1825	1825–1848	Water-powered mechanisation of industry	Cotton and iron	British workers	283
2nd wave	1848–1873	1873–1896	Steam-powered mechanisation of industry and transport	Railways, machine-tools, cotton, iron and coal	Plantations, manorial agriculture, European and American factories	283–299
3rd wave	1896–1914	1914–1945	Electrification of industry, transport and households	Electrical engineering, chemicals and steel	European and American industries and households	299–310
4th wave	1945–1973	1973–1991	Motorisation of transport and other parts of the economy	Automobiles, aircraft, refineries, petrochemicals, oil and gas	Tractorification, suburbanisation of the West, the Green Revolution	310–355
5th wave	1992–2008	2008–(?)	Computerisation of the economy	Computers, software, telecom equipment and microprocessors	Urbanisation of China	355–418

Table 2. Kondratieff-style table of the long-term development of fossilisation. Schematic overviews such as this illuminate some key aspects of the fossilisation of societies, first in the West and since throughout the globe. Industry by industry, material by material, people by people, even the most mundane aspects of social life have come to be tied to the burning of coal, gas, and oil. The result of all this, in an ethnological perspective, is the birth of fossil peoples. Expanded by the author from Malm (2018).

In my view, working structurally, therefore, has a great deal to do with the ethnological tradition of looking for the cracks in an allegedly monocultural modernity (Brox 1967; Højrup 1983; Svensson 1993). It is, at once, a research strategy and an analytical method. As a research strategy, it is simply about showing that another world, another landscape and another kinship structure are possible. As an analytical method, looking for the cracks in this warming world, its landscapes and kinship systems requires a good deal of reconstruction. This should be understood not only as an account of how things really were but itself an active construction which ties together past and present (Almevik and Jönsson 2024: 8). Like all ethnologists working with historical sources, my reconstruction of the transformation of life on the plains is doubly bound to the empirical material at hand *and* my own research problems. Reconstruction is a slippery

concept but for me, it has meant—among other things—to insist on looking for the companions to life.

Returning to the example given above about the fossilisation of the plough, we might say that as long as it was pulled by a horse, and as long as this horse had to eat, and if it is correct to assume that fallow was an integral part of pre-fossil agricultural life, then there might be some relation tying them all together. We should be able to reconstruct how all this added up in a Scandinavian landscape 150 years ago. This is what I try to do in Chapter 2, where I analyse a variety (or 'bricolage', cf. Jönsson and Nilsson 2017: 8–15) of sources, such as publications, ethnological testimonies and archival records. In line with Carlo Ginzburg, I believe that although there are many things we cannot know, these scattered sources 'permit us to reconstruct a fragment of what is usually called "the culture of the lower classes" or even "popular culture"' (1992 [1976]: xiv). But another form of reconstruction was at stake when interviewing farmers about the past. Reconstructions of the first type have a way of creeping into the second, both when I was asking the farmers questions and when I later analysed their answers.

An older farmer, for example, remembered vividly the horse he used to ride as a child, and despite an otherwise excellent memory he could not recall what happened to the horses after the tractor arrived. He could also picture the fallow land when it was there, but was much more interested in keeping the land clean and weed-free. When I spoke to him, I had already tried to reconstruct how the landscape structure was transformed first by the arrival of coal and later by oil. Sometimes, I felt that the archival materials (or my reconstruction of them) was a part of our conversations, like wreckage floating around in the distance, sometimes visible, sometimes covered by the waves of time.

The second form of reconstruction, then, centred less on how things 'really' were and more on how the farmers remembered—or failed to remember—them. Encounters with living people have been tremendously important for this work for each time they seemed to talk in directions other than I would have thought. In the end, their experiences of the history and of 'fossilisation' were something to be reconstructed (Chapter 5). Such a reconstruction, argues Lars-Eric Jönsson (2024: 27), will always be temporary and emerges in ways unforeseen, but it does create a space for movement between past and present. Like Jönsson (who studied psychiatric institutions), my experience with reconstructing the fossilisation of peasant kinship and its ecology led to a feeling and an analysis that the present was, in major ways, colonised by the past.

Linking past, present and future, reconstruction as I understand the method need not be entirely contingent and temporary, which is not the same as implying

any kind of privileged realism. The problems with reconstruction seem to grow if we focus too hard on the 're', which directs our attention to a noun, a fixed state of affairs. If we instead follow Jönsson (2024: 26) and focus on the verb, constructing, we might learn how things were done. In fact, if structuralism (which shares the same etymological root with reconstruction) means anything in ethnology, it should be that beyond the immediate appearance of endless empirical variation, we find a rather limited number of possibilities to which all cultures have resorted when relating myths, building kinship systems, cultivating a landscape or organising themselves socially and politically (cf. Lévi-Strauss 1961: 61, 160; 1983: 10). It is, arguably, due to this feature that we can conceive of ethnology—here taken in the widest sense—as what David Graeber called 'an archive for social possibilities' (2014: 81). In the conclusion, when the empirical material has been presented and analysed (or reconstructed), I will return to the question and demonstrate what a structuralist view of the fossilisation of landscape and kinship structures might imply.

The object of this investigation, then, might be defined as the plains themselves as a cultural landscape in a state of transformation. Approaching the empirical material from this angle has several implications. First, it means locating in space and time some aspects of the farmers' practices which rely on the burning of fossil energy. Today, this means practically every dimension of their lives, whereas it meant very few in, say, 1870. Secondly, I have analysed the material in search of the connections between the fossil energy itself and other closely related elements. The historical and ethnographic material provides examples of such interrelations, as was the case when the steam plough first arrived in Scandinavia alongside coal, sugar beet, migrants, consultants, railroads and sugar factories *as a bundle* (see Chapter 5). Consequently, the method of analysis is a structuralist one in the sense that what matters is the relations between things, not the things themselves.

A structural approach allows us to cut across the boundaries of methodological nationalism which restrict our understanding to that context only.[9] This is

[9] Against the functional school of anthropology, Lévi-Strauss made a similar argument in *The Naked Man* (1981: 609), claiming that we should not mistake the practical limitations of the field work with the 'absolute properties' of the object of study. Like myths, fossilisation has spread across the world incessantly. The many references to Lévi-Strauss in this introduction should not be read as a wholesale endorsement of his entire anthropology. As much as structuralism promised to cast a bridge over the gulf separating Marxism and ethnography (Lévi-Strauss 1961 [1955]: 61; 1977 [1958]: 343), I also see some very fundamental problems with Lévi-Strauss' version of structural analysis. Above all, his insistence that structures are the logical outcome the innate architecture of the 'human mind' (Lévi-Strauss 1983 [1964]: 10) is a kind of mentalism which appeals very little to me and which should be subjected to a good deal of materialist critique (cf.

particularly relevant if we consider the planetary consequences of fossilisation. It is only the global sum of emissions which makes the fossilisation of some Scandinavian farmers so problematic. To study this history structurally, I will study the landscape and its kinship structures as one form among many. Surely, this landscape does presuppose certain conditions, some of which are to be found at the national level, and which therefore might be different in Skåne, Sweden than in Lolland, Denmark, even though the systems of cultivation and kinship are remarkably similar. These differences include different national sentiments or myths about what agriculture constitutes, different historical experiences, but above all different legal frameworks which draw the family farm in one direction rather than the other.

Of contemporary importance in this regard are the differences in sentiment towards agriculture and farmers which seem to dominate in those two neighbouring countries. Sweden is a large, thinly populated and largely wooded country in which agriculture can be seen as an activity which relates to nature and connects with the peasant past. Denmark, on the contrary, is a small, densely populated, heavily cultivated country in which agriculture has connotations of modernity and pollution. These notions are, of course, historical constructs which appear to be changing over time (Hallgren et al. 2020), and they depend on who is looking at and judging peasant culture (see Chapter 1). Similarly, there are great varieties in legal frameworks regulating the sector, and it falls beyond the scope of this work to conduct a comparative analysis.

The structural orientation must of course recognise these national differences, but at the end of the day, what I am after is something else. Instead of looking for differences between and within countries, I want to focus my energy on one landscape type. The plains are, I maintain, cultivated in remarkably similar ways across the border, despite whatever differences in national regulations there may be. The object of this ethnological investigation is to explore the ethnography, the history and the structure of peasant life on these plains.

With this focus, I ultimately want to test a hypothesis which extends well beyond the world of Scandinavian family farmers, namely that fossilisation does indeed have an underlying structure: a question to which I return in the conclusion. Through the analysis of different landscapes and kinship systems, it is the comprehension of this structure which is the ultimate scientific goal of this work. This is not the same as saying fossilisation is everywhere the same (as brilliantly shown by Mitchell 2013), only that the underlying relationships are.

Knight 1995: 71–87). This problem, in my view, should lead to an increased, not a decreasing, engagement with Lévi-Strauss' work.

This approach is inevitably tied up with a series of theoretical, conceptual and methodological concerns within ethnology and Marxism, and to understand what it means for the analyses that follow, some comments on them are in order. Despite the analytical primacy of relations over terms, structuralism is hardly *one coherent paradigm* (Nugent 2007: 423). Instead, it is fair to consider structuralism a bundle of research strategies which aim to bridge the gap between ethnographic and Marxist forms of knowledge. Seen as such, structuralism has been around in at least three waves.

It first appeared in the work of Karl Marx, Friedrich Engels and Lewis Henry Morgan, who inspired the former so profoundly in the second half of the 19th century. The ethnographic basis of Marxism and the Marxist basis of much anthropological thought have now recently been rediscovered (Lindner 2022). The reason that the connection had to be rediscovered was, of course, that it had been exiled over the generations by bourgeois anthropologists like Bronislaw Malinowski, who worked so hard to spare the discipline the shame of Marxist affiliation (Knight 2008). The historian of anthropology Marvin Harris even goes so far as to suggest that institutional 'cultural anthropology developed entirely in *reaction* to, instead of independently of, Marxism' (1968: 249). Secondly, in the 1960s and '70s, an ethnographic structuralism flourished, particularly on French soil, where giants like Claude Lévi-Strauss and Louis Althusser (both of whom articulated their structuralism with reference to Marx) paved the way for a series of important contributions. After the decline of the second wave from the 1980s onwards, one commentator explained the problem as follows.

> In short, structural Marxism was threatened by two opposing possibilities: as Marxism it was relatively indifferent to issues of ethnography and culture and thus was not particularly anthropological; or, in the hands of ethnographers like Godelier and Maurice Bloch, it did become more obviously cultural but looked less and less convincingly Marxist (Spencer 2002: 533).

Rather than being resolved, these issues were largely abandoned (Nugent 2007). Now that the climate crisis has breathed new life into Marxism (Malm 2016; Huber 2022; Wainwright and Mann 2018; Saito 2022), the old question of historical transition has awakened after decades of hiatus. Once again, we are confronted with the same questions which occupied Marxists and ethnologists, and particularly Marxist ethnologists in the 1960s and '70s (cf. Narotzky 2021: 84), and which occupied Marx, Engels and Morgan in the late 1800s. The form of the transition into capitalism is as important as ever to study. But contrary to

the debates raised half a century ago by ethnographic thinkers like Emmanuel Terray (1972 [1969]), Claude Meillassoux (1981 [1975]), and Maurice Godelier (1977), this time we return to the question of transition with a clear analytical focus.

For, as Andreas Malm writes, 'We might have thought that the past two centuries were fairly well covered, but if what may well be their most devastating consequences played out behind their backs, in abeyance, we need to revisit this past' (2016a: 223). We must understand what fossil fuels have meant, which in turns mean paying attention to many details often overlooked until the shock of the Anthropocene forced us to renew our attention. Rather than instituting a contradiction between structure and history, the task is to conduct structural history. My analytical aim is to explore how landscape structures and kinship structures were transformed by 150 years of fossilisation.

On what follows

In Scandinavia, agriculture first encountered fossil energy at the end of the 19th century in the form of coal and, secondly, in the years after the Second World War in the form of oil. I will take these two waves as one of the main principles with which to organise the rest of this investigation.

But what follows is not a chronological story of the how the first steam plough arrived in 1872 and everything that happened since. Instead, *Sleepless Plains* is structured as a genealogy, which begins in the present only to trace certain features of the landscape backwards until the time when they first emerged. This is a classical ethnological method (Hörnfeldt 2009: 44; Frykman and Löfgren 1987: 3–6; Svensson 2002: 70) which owes much to Michel Foucault (1977: 140), who programmatically considered genealogy to be the shaking of the present and its metaphysics. To make explicit the context of the historical investigation *and* to try to measure the depth of its implications, this book both begins and ends in ethnography of contemporary farm life on the plains. The ethnologist Tine Damsholt argues that cultural history is not defined by its object (everyday life, for example) but by its perspectives and its analytical strategies. 'First and foremost,' she writes, 'it is about strengthening the clear present-day basis for cultural-historical analyses' (2010: 20).

Similarly, the structuralist anthropologist Peter Gow (2001: 21–1) provides two good reasons why ethnology does well to begin in ethnography and not in history. First because the historical archive itself is not an image of the past, but only the recording of a certain sectional perspective on it. It is above all states and corporations which generate and save documents about the past, and in doing so,

their own interests have actively shaped what will remain of it. Most of what people did in the past is forever lost. Secondly, the archive cannot ask questions itself. Whatever we find in it depends entirely on how we address it. We always bring our own assumptions to the archive, and though the archive may or may not give material to answer these questions, it cannot object to our assumptions per se.

I therefore begin with some ethnographic snapshots of the contemporary plains in the 2020s. In Chapter 1, the way this landscape is currently experienced by the sugar beet farmers is analysed. It also raises the question of how deep the reliance on fossil energy runs metabolically and conceptually. To begin to answer these questions, a journey into history is necessary. In Chapter 2, I track the emergence of the sugar beet and fossil fuels in Scandinavian agriculture, a story which is set in the late 19th century. Behind these episodes, however, lie others whose history runs further back, which sends us across the ocean to the West Indian sugar plantations in Chapter 3. In Chapter 4, we change perspectives from the landscape structure to the impact of fossilisation on peasant kinship in Scandinavia around the turn of the 20th century when coal started to circulate in and around the family farms. These changes amplified when oil and tractors arrived in the plains after the Second World War. Chapter 5 analyses some of the most important changes by focusing on relations between humans and animals, technology, debt, and how the farmers themselves conceive of this history which, for all living farmers, constitutes the horizon of lived experience. The conclusion, finally, discusses the implications in terms of kinship as things currently stand among the farmers.

The following is a historical study which both begins and ends in an ethnography of the present. This might seem a bit tautological but there are two reasons why such a circular movement is warranted. First, the beginning and the end mirror my own research journey. I began with contemporary concerns about fossil energy in agriculture and related conflicts about the landscape, something which I understood in the light of the Anthropocene. This might, of course, be a purely personal and contingent matter unrelated to how this study should be structured, if it were not for the fact that this very analytical journey reflected the history of ethnological thought *in reverse*. As such, the structure is thought to demonstrate how older, half forgotten, ethnological research concerns suddenly speak to us (or to me, anyway) as the planet heats up. Kinship, of course, represents these concerns, which were initially absent from my investigation (as it is absent from the mainstream in studies on fossil capitalism).

There is nothing strange about this, because, as many observers (Pina-Cabral and Leutloff-Grandits 2012: 387; Eriksen and Nielsen 2001: 69; Albris et al.

2025: 6) have pointed out, kinship was largely abandoned as the main theoretical concern in social anthropology and ethnology from the 1970s onwards and replaced by other concerns, like consumption, globalisation, identity and so on. Instead of the old concepts in Grand Tradition—matriliny, classificatory kinship, postmarital residence patterns, historical evolution of kinship structures—if kinship was now studied at all, it was through concepts like 'relatedness' or 'family' (Albris et al. 2025: 6). At the end of the study, when we return to an ethnographic present, the renewed relevance of this otherwise antiquated research tradition should become clear. Haraway (2016), then, might be more correct than she let on when she spoke about 'making kin in the Chthlucene' (or Anthropocene).

Second, this bridge between political ecology in the beginning and kinship in the end is constructed not as an argument in favour of only one of the competing narratives currently offered as an explanation for those trying to understand the cultural depths of climate change (Anthropocene, Capitalocene, Plantationocene, or, more mysteriously, Chthlucene). Instead, the different chapters emphasise different aspects of these explanatory models within the empirical context of Scandinavian sugar farmers. The study is structured as an exploration of how these analytics might complement, enrich and challenge one another. Clearly, the current challenges of living in increasingly broken Anthropocene landscapes result from historical processes of subsumption of dominant modes of production under fossil capitalism. But this history stands on the shoulders of prior colonial histories in which experiences with plantation designs shaped landscapes, modes of life and ways of thinking about both were cultivated long before any coal was burned. These aspects are, as the following chapters will show, very much relevant to the Scandinavian context.

The plan of the work can be represented in this way.

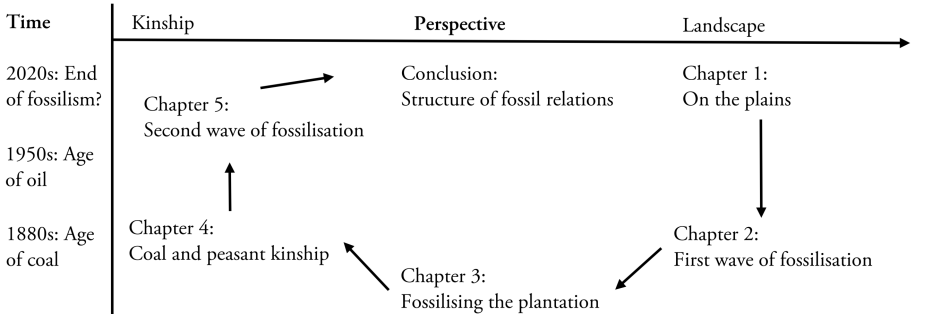

Figure 2. The work departs from the tensions inherent in the contemporary fossil landscape. To fully appreciate the implications, however, a roundtrip into the history of the landscape and its kinship structures is necessary. Only after studying how these were transformed by fossilisation over the past 150 years, can we begin to appreciate what kinship has come to mean for contemporary farmers in the Anthropocene.

With this research design, I want to throw a boomerang into history. When it returns, I hope it brings back new perspectives on the tragedy we have cultivated for ourselves. But I am not on the lookout for ready-made solutions in history. I don't think that the post-fossil future of Scandinavian farmers will look anything like their pre-fossil past, nor do I believe that this would be only a good thing.

What I do believe history and ethnography have to offer us is questions. For if it is indeed the case that fossilisation has shaped not only the way we live, but also the way we think, we are perhaps still posing fossil questions to the green transition. As we begin to take the first steps backwards out of fossilism, both ethnography and history are means through which we can learn to ask other, undisciplined and unfossilised, questions.

1 *On the plains*

Between the Scandinavia Peninsula and the European Continent lies an area of open, fertile plains spread out over the Southernmost part of the Swedish mainland and a few Danish Isles to the south and west of that. There, three sugar factories are still in operation, and they are supplied with sugar beets by around fifteen hundred men (and they are exclusively men) who currently remain active sugar beet farmers.

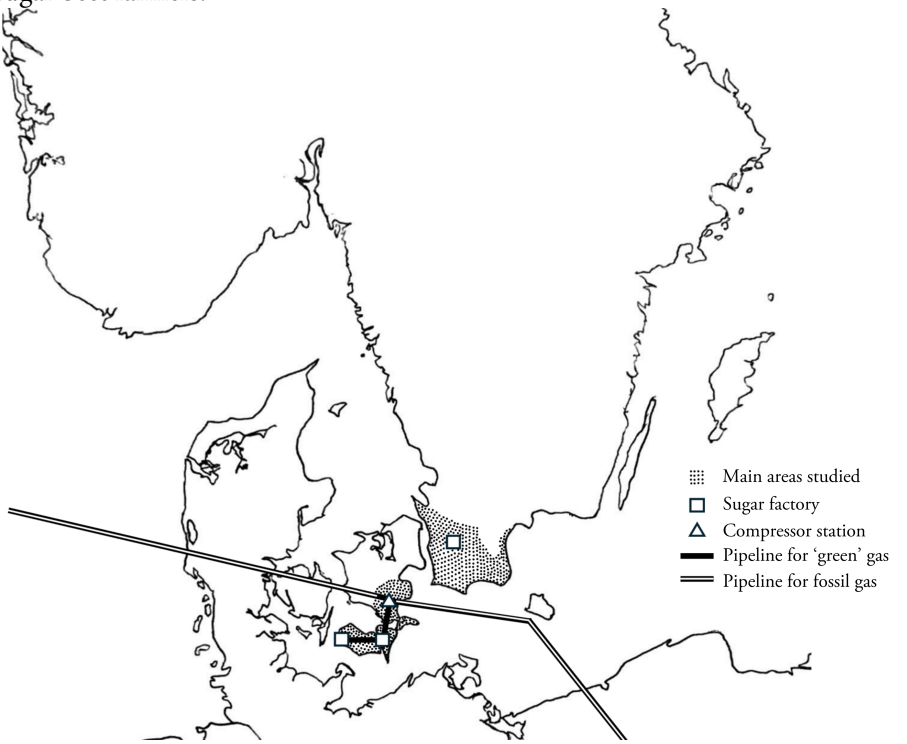

Figure 3. Map over Southern Scandinavia with the pipelines running from the oil and gas field in the North Sea to the West over Denmark through the Baltic Sea to continental Europe. The sugar factories in Nakskov and Nykøbing-Falster, Denmark, and Örtofta, Sweden, are the three remaining central hubs still in operation on the plains of Southern Sweden and the Danish Isles at the time of writing. Map drawn by the author.

By the 2020s, the factories ran into some unforeseen problems. Specifically, the fact that to produce 700,000 tonnes of sugar to satisfy Scandinavian mouths which had acquired a historical taste for sweetness, they emitted around 288,000 tonnes of CO_2, mainly from natural gas and coal, was becoming an object of concern (Larsen 2020; Mikulic 2021). This made the two Danish factories the second largest emitter of CO_2 in the country, while the Swedish one reached third place for its region. For the 150 years they had been in place, it had been largely unproblematic which kinds of fuels the factories ran on, but now it began to look like an insurmountable issue.

For the sugar factories, the immediate solution became building a pipeline which could supply it with non-fossil energy to boil crystals out of beet juice. As it happened, a company building pipelines offered to do the task. The sugar factories accepted, and the state financed it all. Later, environmental impact reports were drafted. In February 2022, a citizens' meeting was held to inform people about the plans to build a 117-kilometre pipeline. In the press notice, the company building the pipeline and the two governmental agencies in charge of the environment and energy wrote that 'it is important to us that citizens and others interested get an opportunity to hear and ask questions about the project' (Fieldnotes).

In such a situation where the current landscape becomes so problematic that it cancels the future, the question is, what parts of the past and the present are allowed to live on? In which elements do we put our faith, and which ones are discarded? How can emissions be reduced without risking the welfare of the factories and their employees or the farmers for whom sugar beet was a rather profitable crop?

At the meeting, a range of different answers to these questions were articulated. One woman, for example, pointed out that leading energy experts had calculated that a pipeline, even if it did eventually come to carry biogas, would not necessarily mean an improvement in the climate. 'How, then', she asked, 'can its use be defended?' (Fieldnotes).

'Well,' answered the host hesitantly, 'it is a question which we find difficult to answer in the project'. His hands folded on the white tablecloth beside an untouched glass of water, he continued. 'You might say that we are put into operation to establish a gas pipeline, and our assignment is that biogas is part of the green gas. So, it is not a debate that we, as such, want to go into'.

Held during the dying days of a pandemic, the organisers of the citizens' meeting about the environmental consequences of the pipeline to the sugar factory did not seem to mind that it had been relocated online. Critical questions were

inevitable. While it was clear why the pipeline had to end in the sugar factory at one end, it never became clear why its starting point was in a village by the name of Everdrup. Located in the middle of the main island of Sjælland, this tiny settlement housed around 250 souls. If it was not for the fact that another pipeline happened to run through the village carrying natural gas from Norway to Poland, few probably would have noticed that this place existed.

The farmers themselves seemed to be more preoccupied with ground level issues. 'How will you make sure to restore our drains properly?' 'Why don't you place the pipeline in the line between the fields were there are no drains?' and so on. At the citizens' meeting, it remained a mystery why a pipeline allegedly built to move away from fossil energy was connected to a compressor station pumping exactly that through the landscapes.

'Can the companies guarantee that black natural gas will never flow through the planned gas line from Everdrup to Nakskov?', a woman asked with reference to the two companies building the pipeline in the chat of the zoom meeting, 'If it will, as described in other places, is the project Green Gas to Lolland-Falster then not false marketing and an expression of greenwashing?'

'I understand', the deputy director answered, 'that the questions relate to the prehistory of the project' and pointed out that now the decision had been taken. 'To the first question', he went on, 'as to whether we can guarantee that no natural gas will flow through the pipeline, the answer is, no'.

The way the project had been planned, he said, around half of what goes through the pipeline is thought to be natural gas and the other half biogas. Jumping over the question of whether it was greenwashing, he went on to explain why the gas line was necessary instead of the alternative of electrifying sugar production. Local politicians really wanted a pipeline because they thought it an important step in building power-2-X solutions which, again, was necessary for their vision of the green transition.

Mary Douglas (1966: 35, 40, 160), famously, said that dirt is matter out of place. What is climate change other than carbon out of place—carbon which should have been kept underground, but is now in the atmosphere above us? For the climate activists, the pipeline was out of place. It was dirty because it allowed a fundamentally unviable landscape to wash itself green.

By the 2020s, the 'green transition' had become an ideology of its own, or even a myth in the ethnological sense of being simultaneously true and false. As such, it had become something which nobody could openly deny was inevitable, even desirable, and consequently, everyone seemed to project their own values onto it. The green transition was a mirage, a political project, planetary necessity and a

philosophical debate about what it might mean to live without fossil fuels. As the citizens' meeting illustrated, the technological view tended to dominate. Rather than being the problem, more pipelines were promoted as the solution.

According to one established ethnological view, a myth is a necessary part of social life because it equips people with a common understanding of what the world is and what their place in it is (Højrup 1983: 30–1; Bottici 2007: 4–5; Pedersen 2023: 13). We might ask, for example: Whose conditions of existence are ultimately inscribed in the landscape when more pipelines are rolled out? This is an important question which indirectly frames this chapter, in which we will look at some dimensions of contemporary peasant mythology which seem to collide both with the visions of the pipeline and recent dreams of sustainability.

Around 2021, I heard rumours about a fear shared by many who cultivate sugar beets in Scandinavia. In particular, it concerned those who, for whatever reason, chose to shift from a conventional way of using the land to an organic system in which the application of artificial fertiliser and pesticides was taboo. The result was that between the dark green plants which grew knee-high, many seeds would begin to germinate, stretching towards the sunlight in the Darwinian hope that they might get a chance to pass on their genes to the next generation.

For the farmers, as rumour had it, this was terrifying.

Some were so ashamed of these field that they turned to professionals for psychological therapy. The messiness was just too much to bear. I first heard about all this from a senior executive of a sugar factory. Somewhat dismissively, he noted that there was in fact a market for organic sugar. This being so, there was little choice but to cater to it, although it clearly posed a range of technical difficulties. He noted the rumour in passing, as somewhat of a funny aside, paradoxically enough, about the silliness of organic farming, which was considered more idealism than economic realism.

Not long after, I heard it again in another version in a more private setting. That farmer did not want to sell his land to this farmer, a family member told me, because the latter farmed organically. At first, the speculations went that there was cold air between them—that the question of organic versus conventional agriculture was merely a bad excuse for personal conflicts. But it soon turned out that the people in question—the one who wanted to buy and the one who did not want to sell—were, in fact, very friendly. At a party in the countryside, they were even seen drinking late into the night. When everyone went home to sleep, they were still laughing. But it was later disclosed that the land-owning party had spent his life cleaning up the fields and could not bear to see them grow full of weeds.

Weed shame

Eventually, I decided to go and ask the farmers about it. Karl was a retired farmer in his seventies. With him, a long line of Swedish peasants had come to the end of the line. When he retired, he moved out of the family farm and into a summerhouse. His daughter and her husband moved in, but they didn't want to farm, only live in the countryside. Then he leased the land to a neighbour.

By then, a line of farmers seven generations long was broken.

'Surprisingly', he said, 'it was quite easy for me to move out' (Interview 2). We were sitting on his porch, drinking coffee and eating After 8s which had melted in the sun. Åke was friendly and jolly.

'I heard that some of the people who started cultivating organically were ashamed of their field because of all the weeds', I said.

'Yeah, I can imagine. But it is difficult for me to say. I wasn't even entertaining the thought'.

'No, no, but I was thinking about this: You are driving around the landscape and checking what the others are doing. Or is that what you are doing?'

'The best police are always the neighbours', he said. 'In all contexts!'

'But what do you think it is about? That you don't want any weeds. Is it purely economic or is it also…?'

'I don't even dare speculating about it. No, I don't. You will have to ask somebody else about that'.

'Yeah, sure, I will have to do that'.

'I don't have any opinions about it. We were, anyway, doubtful about it', Karl concluded about organic cultivation when his wife came out to serve us coffee. He told me that when the first attempts to shift to organic beets took place in Sweden, one pioneering farmer whom he knew had called the municipal employment service to hear whether they had some people who would be willing to thin the beets for him. The problem was that with organic cultivation, pesticides could not be applied, so to keep the fields free of weeds, a lot of manual weeding was necessary.

At the municipality, they were happy to hear that what he was asking for there were unemployed people. 'How many do you need?', they asked him. Since he had several hectares, perhaps five or ten, he said, 'I can start with one hundred'.

The woman on the other end of the line went silent.

'Are you serious?'

'Yes'.

'Okay, I will have to get back to you', she said. She then called the neighbouring municipality to hear if they had more unemployed available for

such a situation, which they did. Some days later, ten men arrived at the organic beet field in a bus. At lunch, there were five left. When afternoon coffee was served, three were left.

The next day, the bus driver showed up alone.

Karl's reply to my question and his little anecdote contains a whole series of contradictions which run through modern farming life. First, while some people do consider the possibility of turning to organic farming, this is clearly not an ideal shared by Karl. Second, the talk of weeds bringing shame did not seem like a foreign thought to him ('Yeah, I can imagine'), but for someone who was as observant and outgoing as him, it was not something easily articulated. It was there surely, but to explain it is difficult, except to say (partly on my suggestion) that it had something to do with mutual policing, which the farmers allegedly acted out on each other. Third, the topic led his thoughts to a concrete story about another farmer, whom he knew, who did turn to organics, for an unknown reason. As a result, he faced all the usual problems that follow. In the absence of pesticides, weeds will grow wildly, forcing the farmer to find other ways of managing them. The option resorted to in the story was one which, as we will see, followed the history of the sugar beet closely. It involved sourcing workers to manually weed between the long rows. While such a thing is, no doubt, technically possible, it comes with great cultural difficulties. How is, the story makes it clear, a farmer to find one hundred (on this point, the story probably exaggerates) willing workers?

In his hesitant response and in the little story he told, Karl wove several themes together. The silence of the field shame as opposed to the articulation of the repertoire of modern, mechanised agriculture (people arriving in busses, and behind them tractors). The experiences of the past (the theme of migrant labour, as we shall see) is juxtaposed with the possibilities of present-day agriculture: The next day the bus arrived without people, rendering bleak the prospects of organic beet farming. The moral of Karl's little story mirrors that of the executive of the sugar factory. Organic cultivation, particularly of sugar beet, is probably more unrealistic idealism than the practical sense of any good farmer.

Of course, it is only natural that someone cultivating the land is concerned with the health of their crops and that they are not suffocated by competitors. Still, I think the rumours about weed shame can tell us quite a bit about the culture which created this rationality. It is, in my view, as good an entry point as any into the world of fossilised farmers with all their crops, weeds, machines, pesticides, nightmares and passions.

Aksel is a farmer in his sixties who lives with his wife on a farm he inherited from his paternal grandfather. He provided me with the following account of how the fields are supposed to look.

Weed shame no. 1. Lolland, Denmark

The thing is, when it comes to weeds, farmers are very much judged on how your fields look. We go around and give each other grades. No, you do that up here (points to his head), it's not something you talk about, but we do it anyway. And the thing about us being colleagues, they have a lot of weeds. In some fields you can't tell if it's grain or weeds. And I think that's it. Then there's something like, 'aaaargh, is he getting something out of that?' And of course, it affects them too. They hear it too. I think that's what does it. And especially in beets. If you have a beet field that's full of weeds, you don't actually harvest anything. Because then the weeds take over the power from the beet, so they never get bigger than this cup. I think it's things like that.

But you are aware of what others might think?

Yes, you are. And there are also some neighbours who have conventional farming, so you think 'aaa, that guy, he usually has it under control! He's always on top of it. He has clean fields. He always harvests much more than the rest of us'. That's the way it is. You could say we're not in competition with each other, but there's still something there. There is. We can't deny that. And there are probably some organic farmers who have had a hard time, I think, because there may be some who say 'stop that nonsense! Why don't you buy a field sprayer for those weeds!' I think it has been like that. I feel that it's changed. It's a shift that's happened. Now you don't do that anymore. Because the organic farmers are insanely talented.

So, it almost gets to look like a conventional field?

Yes, it does. It can be hard to see (the difference). And that's a very good thing. There you go. And this is because the young farmers are skilled. They have also learnt what to do. In the past, when organic farming started, no one had taught them what to do. Now you can take an organic programme at agricultural college. Where you learn what to do with crops, how to make sure the weeds germinate so you can harrow them away before sowing. So stale seedbed as it's called. And things like that. So, it makes it easier. And I have to say, we who are normal (conventional farmers) also learn from those things. I've actually found that out, about the weed thing, if you have a field that has been lying all winter, and you harrow it, then those flashes of light, if the seed comes up and gets a flash of light, it sprouts. Then they realised you must

> harrow at night. 'You can't drive and harrow at night!' So, they covered their harrow with a canvas cloth around it, that is, around the outside of the harrow, so that no flash of light comes in when you harrow, so you get less weeds (Interview 1).

This testimony brings up a theme which seems to dominate almost any account of weed shame initially. On the one hand, the farmers somehow keep an eye on each other's fields although they don't really have to. On the other, the fear of weeds probably does reflect good economic reasoning, because the more weeds there are, the worse the crops.

Five crops circulated on the informant Christian's fields: sugar beet, barley, grass, wheat, and rape seed. As there were no longer animals on the farm, the grass was not used as fodder. Red fescue, as it was called, was harvested by a combine harvester, and sold as seeds for golf courses, roadside ditches, and the like. In fact, all the crops were sold, and nothing was produced for household consumption. Forty years into his career as a farmer, Christian's estate had grown significantly. A hundred years ago, his paternal grandfather had bought the farm which, at the time, like all other 'farms' (*gårde*) in the area had around 30 hectares of land with it. At the time, two farmhands and a girl lived there with the family. Since the 1980s, Christian had begun buying up neighbouring *gårde* when they went bankrupt, or the owners retired with no willing heir. At first, it was one close by. Then another and another. As the decades passed by, he had come to own almost 300 hectares. A hundred years earlier, this would have been enough land for ten extended families or perhaps around one hundred Christian souls. Christian operated it alone. Only in the peak seasons of sowing and harvesting did he get some additional help.

The soil on the plains is heavy moraine clay left behind from the last Ice Age. Stiff, wet, and heavy, the soil is both rich in nutrients and demanding in tilling. This makes it optimal for cultivating sugar beet. The landscape is dominated by open field, as it has been since Christianity and the plough arrived there almost a thousand years ago. Apart from the sugar beet fields, there are fields of wheat, barley, rape seed, and grass. These fields had all grown considerably in size, now seemingly as endless as they were empty and silent. The old villages lay, many with their church, about three to five kilometres apart from each other, but many farms had been moved out into fields many generations earlier. By, then, the old versatile systems of cultivation had given way to highly specialised modes of operation.

For an outsider passing by, there was, at first, nothing much to see. Surely, in spring and late summer, you can see the tractors out there ploughing, harrowing, sowing, or reaping the crops. When the soil is turned, flocks of seagull gather on fields to feast on the worms thrown to the surface by the plough or the harrow. The fields look like large flat uniform squares, divided by the occasional wind belt, an alley way of willows, or a group of trees. To the farmer's own eye, on the contrary, it is a landscape endowed with symbolism. Every field belongs to someone, and when you walk or drive around with the farmers, they often knew to whom.

When I arrived to visit him on one summer day in 2024, he was busy seeing to it that the weeds did not get a hold on his fields. He did so from inside his tractor which drove itself through the fields. Linked up to a GPS system which had logged the coordinates from last year, it sprayed pesticides automatically. Were the tractor to go slightly off track, it would readjust automatically, and the nozzles stop spraying where it already had been. Only at the end of the long field did Christian have to do anything—turn the tractor around.

Like everybody else at the time, he spent his time scrolling through his phone while the tractor worked for him. Around ten o'clock, it rang. It was me calling him to say I had arrived at his house.

'Great', he said, and promised to be there shortly. Five minutes later, he returned to this farm, a well-tended rather large house sitting slightly elevated in the landscape. A robot mower moved slowly across the spotless lawn. The hedges around it were trimmed and behind them opened a field on which barley struggled to get a hold after a spring of intense rainfall. He had been a farmer his whole life and he never thought he would do anything else.

We shook hands, exchanged a few polite words and then walked up the three steps to the front door. He took off his shoes outside and said I could keep mine on. I took off my shoes. Moving inside, he went straight to the sink, which was in the entrance and washed his hands, very thoroughly. How civilised, I thought and then remembered that he had just been handling what most people would consider poison, although he used the more neutral term 'chemistry' (*kemi*).

The good farmer

In an influential paper, the sociologist Rob Burton (2004) touched on the symbolic significance of weeds for farmers in Britain. His immediate starting point, however, is one of governance. After having adopted a 'productivist' approach (exploiting every economic possibility to the fullest) since the end of the Second World War, British farmers have found themselves under increasing

pressure to adopt other motivations for what they do. As environmentalism emerged from the 1970s onwards, farmers were met with a long series of demands that on top of producing food, they should also take steps to protect habitats, diminish their environmental impacts, and fulfil social, cultural and heritage functions in rural areas (Burton 2004: 195).

Many of these attempts, however, failed drastically as the farmers simply rejected them. For policymakers to succeed, Burton argues, they need to understand the symbolic world of the farmers. They need to learn to see through the eyes of the 'good farmer'. The problem was that 'The farm is not simply an object. It is consubstantial with the farmer and, importantly, it is the very part of the farmer that is used to express his/her and his/her family's identities' (2004: 208).

At this point, the weeds enter the picture.

'The symbolic value of regular, weed free landscapes is not unique to the Marston Vale' in Bedfordshire, England, 'but exists across a range of countries and farming landscapes—for example, in Southern Germany, the Canterbury plains of New Zealand, the central plains of the United States, and the Upper Yorkshire Dales of the UK' (2004: 208). Weeds have, somehow, come to be a stain on the farmers' landscape.

But where does this this symbolism come from?

Burton pointed to several possible sources. It could be a question of regional identity ('We are orderly wheat farmers here!'). It could reflect an economic calculus: Perhaps weed-free fields are simply better business. 'Thus, as some farmers pointed out, it is relatively easy to maintain a good appearance of the crop if sufficient money/time is invested in ensuring that crops are regular (for example, through increasing fertiliser/pesticide use), however, this does not mean that the farm is profitable' (2004: 209). While a farm with messy fields could be seen as poorly managed, its economic situation was not necessarily bad. It could be a way to display one's management of the land ('I know what I am doing here!'). Finally, Burton speculated, it could be a current that ran deeper in these cultures: 'it may be linked to Judeo-Christian beliefs concerning the relationship between God, people and nature, and the divine substance behind the right of stewardship' (2004: 209).

'Those who labour in the earth are the chosen people of God' (2004: 210).

Figure 4. A view of a beet field free of weeds and therefore also free of shame in early September not long before the roots can be harvested in Lolland, Denmark. Photograph by the author.

I began noticing whether there were weeds in the landscape as I drove to interview the farmers, when I took the train to Lund, or whenever I happened to find myself in the countryside. Before, I don't think I ever so much as thought about it. I observed that the weeds were very unevenly distributed on the sugar beet fields. Some fields were completely. Others had only a few stalks towering over the sugar beets. And then there were those which were completely infested. As you passed by them on the country roads, you had to look closely to realise that sugar beets lay below.

The initial theme of economy plus mutual policing appears repeatedly when talking to the farmers. Albin, a farmer in his eighties who still worked the land, elaborated the relation between the two as follows when I asked him, 'Is it true that there is a lot of shame attached to the weeds?'

Weed shame no. 2. Falster, Denmark.
Aaaa, there must be. I would think so. But it also has to do with economy. The more weeds, the less money is coming home. It is also embarrassing having such a field.

Why is that?

There was not supposed to be weeds; there was supposed to be sugar beets.

Do you think that you're judged by the others?

No, no. Well, it may be that they are laughing at them a little. Now, there was one over here—he was not an organic farmer—he had gotten a pretty dirty beet field, and he wanted more land. Then people said, 'Don't you think you he had enough land when he can't keep it clean?' That is the way it is.

Do you think it's true that you would be reluctant to sell to a guy like that?

No, I don't think so. It is all dollars and cents (*kroner og ører*). If he gives a good price, then everything is for sale (Interview 3).

Like Christian, Albin points to the reasons already mentioned: policing and economy. Up to a point, the whole thing is pushed aside as something that doesn't really matter, while it is clearly, at the same time, an object of concern how many weeds are out there.

'It is against shame's nature to present itself explicitly, for example, in interviews', three ethnologists recently wrote (Folker et al. 2025: 4). Researching shame about bad teeth from an ethnographic angle, they pointed out that while shame is an emotion which is avoided or kept secret, it nevertheless spreads socially like rings in the water. These remarks seem applicable to farmers' relations to weeds for two reasons.

First, because throughout the interviews, it was clear that it was always someone else who had an ugly field, never my informants. Second, it was equally obvious that the feelings reverberated through the countryside. As much as weed shame was felt as an inward and personal experience, it was communally negotiated through subtle interactions, gossip and so on. Therefore, as Folker and her associates (2025: 8) point out, shame has a class dimension.

For the farmers in Scandinavia, this class dimension is profoundly historical. Over a few generations, the around 600,000 farms that existed in Sweden and Denmark at the end of the Second World War had been reduced to some 40,000 full-time operated farms (Flygare and Isacson 2011; Kærgaard and Dalsgaard 2014; SEGES 2018; Skovgaard 1951). In average, then, around 20 farms shut down every day. For 70 years. The lands and machinery were sold off to an expanding neighbour, rather than letting new blood into the old industry. The same area was cultivated as before, but where it took a hundred people then, a single man could now do the job. In Sweden, 414,441 farms in 1944 had been reduced to 58,218, of which about half were operated on a full-time basis. In Denmark, 200,000 had been reduced to just 6,000 (see Chapter 5).

As Albin demonstrates, the prospects of buying and selling land occupy the farmers. Although some land can be sold, other parcels cannot. For the farmers, the core of the estate should be intact. Albin also told me a story about the role played by weeds in such acquisitions. It went like this.

For decades, he observed one field which was rather ugly. It had a lot of weeds in it because its owner did not spray *chemistry* on it. The field could be seen from his window, and he passed by it on most days. It was, he told me, a mess.

Then, the owner retired, and Albin bought it.

His eyes lit up when he proudly told me that he managed to clean the thing up. It was extraordinary how many weed seeds polluted the soil as it had never been sprayed before. 'It was simply infected with it'. In just a few years, it was complete clean. Dead soil was a goal of its own. Albin explained that

> It is almost clean. They hadn't sprayed it before. So, the plants couldn't take it. They are not resistant, so it works. Now we hope it will continue to work. That we can exterminate it before it gets resistant. That was bad, it was very bad.
>
> *When you get the pressure down, can it then stay on a fairly decent level?*
>
> Yes, it can. We hope for the best (Interview 3).

Albin's accounts have already introduced two competing reasons why there has come to be much more trouble with weeds. It could be because the farmers stopped burning the straw in the field, a practice which simultaneously spread fertilising ashes and destroyed the weed seeds. Or it could be that it is a result of the ample application of *chemistry* to which weeds like foxtail or white goosefoot have become resistant. Whatever the case, these weeds are a source of symbolic, and probably also financial, stress for the farmers.

The good farmer, then, is, above everything else, the one who manages to steer the estate into the future. Peasant culture, here taken in the widest sense, needs to be understood in this light, both when it comes to attitudes to weeds, and other reactions.

In a series of subsequent publications, Burton et al. (2008) elaborated on farmers' resistance to a range of voluntary agri-environmental measures based on Bourdieu's ideas about cultural capital applied to agriculture. What is at stake here, the authors claim, is not just economy. 'Becoming a "good farmer" is a project of self-improvement involving practice (repeated on a seasonal basis)' to manage farmland more efficiently (Burton et al. 2008: 20). Weeds in the field would result in a loss of cultural and symbolic capital.

On the face of it, such explanations seem justified. But for my purposes, they concealed as much as they revealed. Why the weeds? And why was it that the farmers responded in this way exactly at the time when much of the surrounding society began demanding more wildness and more biodiversity in the fields? While I appreciated the fact that they brought the question of weeds into the scholarly literature, the framework borrowed from Bourdieu seemed to leave the historical dimension at the doorstep. Why now?

In some of the papers that followed, certain steps have been taken in this direction. Sutherland and Darnhofer, for example, explained that 'completely weed-free fields are no longer universally recognised by farmers as a good thing' (2012: 324). Particularly, it was organic farmers who shifted away from 'the institutionalised nature of cultural capital in conventional farming'. This is attributed to a change in the 'rules of the game' of farming, ranging from new flows of subsidies, environmental schemes, cross-compliance, short food chains and the demand for organic food (Sutherland and Darnhofer 2012: 234). Changes in the attitudes of some farmers, but by no means all of them, are documented, but this body of literature, taken as a whole, pays little, if any, respect to the landscape itself, and the metabolic relations to which feelings of shame or pride are attached.

Potentials for change

Some farmers decide to abandon the conventional system of cultivation which came to dominate after the 1970s. This often means a series of technical and cultural issues. The weed problem, for example, needs to be handled in another way. The pros and cons were discussed by another informant, whom I also asked about the shame (Interview 4). In this scheme of things, organic farming represents both a break and a form of continuation. The kind of organic cultivation practised by the beet farmers is still one in which the entire landscape is endowed with exchange value. It is still caught in the same spiral of development as conventional modes of operation, but it does refrain from some of the elements which allowed conventional farmers to grow to up to hundreds of hectares over the past hundred years.

William was a farmer with long-standing relations to the soil. He had cultivated organic sugar beets for a few years when I visited him on his farm one September morning in 2024. The beets were large and approaching harvest. To make sure that the organic beets would be kept apart from the conventional ones, the sugar factory launched the 'campaign' with their processing. For one week in late September, all the conventional beets had to wait while the organic ones were

lifted out of the ground, placed on trucks, taken to one of the factories, grinded, boiled, packed and shipped. Most of it was sold directly to other companies making organic candy and cakes.

He had made the shift to organic cultivation many years earlier and seemed completely at ease with the challenges it involved. At first, however, it was not entirely painless. The transition threw a whole bundle of problems at him.

One problem was that he could no longer use *chemistry*. Having been raised on a farm himself, he had learnt from his owner father how and when to spray. Later, when he studied agronomy, he took in the gospel of the conventional mode of operation on more scientific grounds. He was only 24 when he took over his own farm which had 150 hectares. 'The sugar beet is the crop we have which competes the poorest (against the weeds). It really needs nursing'. 'You can always sow some grains, and it will become something. But that is not the case with this (beets)'.

Another problem was how to get the necessary manure. In his earlier life as a conventional farmer, he could buy as much artificial fertiliser as he wanted, although there were increasingly sharp restrictions on how much could be applied because of the environmental consequences. There were, in fact, organic fertilisers for sale, but they were expensive. The alternative was to bring animals back on the farm. William reintroduced cattle. Why make the transition? What is the motivation to take on all this extra work? What was wrong with the old mode of operation?

Whenever asked about this, conventional farmers answered in unison. It was the economic aspect. For all your extra trouble you would be rewarded. An organic beet sold for three or four times as much as a conventional one. For most of them, the prospect for this kind of profit was not enough to justify all the trouble. Oh, and then there might be a few idealists among them, but it is mainly economically motivated, they assured me.

The farmers making the transition into organic farming will often start with small plots of sugar beets. Over the years, one hectare becomes two before making the jump to a more commercial scale of ten, twenty or more hectares of beets. To combat the weeds in the absence of pesticides, the organic farmers had two options. Either they weeded manually like they did before pesticides, or they buy one of the robots that have recently come onto the market. In the first case, it turned out that local labour was hard to come by, particularly of a quality deemed high enough for a good outcome. So, the organic farmers did what beet farmers had always done: source labour from Poland, Ukraine or one of the Baltic states. Special-made wagons were built to fit twelve workers lying face down a foot above

the ground. Lying on their bellies, they could weed while a tractor moved slowly and steadily through the rows of sugar beet.

'Did you also lie out there yourself?', I asked William.

'I tried it, but I was walking behind to hoe what had been missed. It was more like being an overseer. Some were not good enough. You could see two rows that were… away with them, get a new one (worker) on it' (Interview 4).

It was a very expensive method of combating weeds.

For many it was so expensive that they decided instead to invest in a farm robot. Initially, many were sceptical about it but after a few years of improvements sentiments were becoming more positive. It was deemed to deliver when the farmers inspected the outcome on their neighbours' fields. 'It looks good'.

'I have been lurking a lot on the sideline'.

'Now we will drop the (manual) weeding', he said as he had bought a robot. 'It will be a big step for me'.

But why the transition?

William's explanation, however, introduced another motivation besides economy and idealism.

'Is it different', I asked him, 'than ordinary crops?'

Weed shame no. 3. Lolland, Denmark

Yes, it really is. It is more challenging. We had gotten tired. It just went on and on. I like getting into it. The other way, it is easy enough, as long as you have the equipment you need. This is more challenging.

Was it something in particular which made you want to shift to organics?

There was a boom back then. It was the challenge and the economy of it. There was better economically but not just that, also the challenge of it, right? We looked into it at lot. My wife also wanted animals. She is also educated in agronomy. If she was to be a part of it, it had to be organic. So, we met. Two parallel roads, you know. In the end, one of us had to give in. Now she moved down here with me, so I had to give in on that front. That was fine.

Okay.

It has been a journey. It is the challenge, but it also—I hear this from my colleagues, too: you grow from organics. It is not just. In the beginning, you don't know. It takes five years. Then you actually do like it.

How do you grow? What happens to you?

You need to be able to take it. Also, the weeds you have in the fields. You cannot just act. You really need to plan. Once you have laid your crop rotation,

you cannot really get this crop after that one because this one propagates one thing. You must take root weeds with this one and so on.

Okay.

Not so much screwing around if you do it properly. Pests you can't do so much about. Last year, we lost thirty hectares of peas. They were eaten by lice. You couldn't do anything about it. You must stomach that.

That must suck as a farmer but that also must be something of a financial loss?

Huge one, yes, it is. It is. But then we win on other fronts. You learn.

But all this weed. . . I heard some of the people from the sugar factory talking about it. It can be tough, it seems, for those who shift to organics. I don't know if it is particularly hard with sugar beets.

When you say tough, what do you mean?

It sounded from him like maybe the neighbour takes another look or they were ashamed of it or something.

To be honest, there is a lot of psychology in it. I also help some family members who are conventional farmers. So, I flex between the two. The transition it was very difficult. In the conventional, we hunt the last weed plant out there and here at home in the organic way, we let it be. You can't really do anything. It was difficult for the first three years. Really difficult.

How so?

Mentally.

How did you experience that? Do you feel it in your stomach?

Yes, you do.

Do people say anything to you?

Nmnnjoooo. I think it's something you think.

What is it about it?

You can't do anything. You don't know what is happening. You have never had a field that you didn't spray and see what happens. You would never get that idea. It is the transition.

It was very, very drastic (Interview 4).

The organic farmer William here suggests that the difficulties with weeds are not set in stone. Under certain circumstances, for example when pressed by one's spouse, there is significant room for new systems of cultivation and new aesthetics. It requires reorganisation of the farmers' view of themselves and how they view each other. And these changes do not go unnoticed in the countryside.

All this material on the cultural problems of weeds and the solutions farmers come up with to tackle them should be seen in the light of a long-standing

tradition within ethnology of studying agriculturalists as an 'internal Other' in modern society. At a time when biodiversity is celebrated in the surrounding society, the anxieties around unwanted invasive species might seem backwards. But for the farmers, weed shame is 'commonsensical, cogent, and perfectly logical', to use Don Kulick's (1998: 232) phrase. Even for those who manage to move beyond the aesthetics of a clean and weed-free field—and some do, even with great economic success—it is still something 'you feel in your stomach' and may keep the farmers awake at night.

Figure 5. A view of a September beet field overgrown with white goosefoot (*Chenopodium album*) in Lolland, Denmark. Photograph by the author.

The interviews above suggest that fields are the canvas on which the farmer paints a portrait of himself and his family farm. To paint weeds is to allow oneself and, by extension one's ancestors, to stand vulnerable against the brutality of the liberal world, where debt weighs the plough down deeper and wider into the landscape. The widening gap between the two highest values of the farmers, the continuity of the family farm and the hierarchical expansion, was filled with weed shame.

The weed shame was the internalisation and personification of a competitive landscape whose terms were beyond the farmers' control. For them, freedom continued to be a concept attach to the possibility of remaining an independent producer on a market with roots in the family farms. Clearly, it was not an easy

balance to strike, as the two forces seemed to pull in opposite directions. It was the way history spoke through the farmers who were the last representatives of a vanishing form of life.

Their shame was the mirror image of their peasant notion of freedom. The shame and the freedom were two sides of a tradition given and transferred from the dead generations. It was the fear of weeds that woke the farmers up at night with a nightmarish feeling that something was simply not right in the fields. They knew what their neighbours were thinking, because they, too, lived under conditions not chosen by themselves but by whatever history had in store for them.

Weed shame might very well be a neolithic custom, but it expresses well the challenges farmers face in adopting to the Anthropocene where the fields have grown so large that the farmers are always struggling, often failing, to keep the fields clean with whatever means they deemed practical and ethical. In one conversation William, the organic farmer always looking for challenges, said to me that conventional farmers who still rely on *chemistry* had had all possibilities to combat the weeds. Yet they were still out there. He knew where his organic colleagues, few and far between, had their fields, but otherwise he would not be able to tell which weeded fields were organic.

'So, some of the fields that are infested with it', I asked him, 'it may be because they didn't spray enough, or they take over anyway or they have become resistant or what?'

> No, it is just management. In my mind, they had all possibilities to do it as good as their neighbour. He wasn't there that day. He was away on a weekend when he had to spray and then the rain came afterwards (Interview 4).

At the time, so little pesticides were allowed that the farmer had to be on the spot at exactly the right time. Alone on his hundreds of hectares, this is not always possible, despite the immense technological tools available to him. So, when he fails to spray his *chemistry* in time, weed shame takes root and grows.

The peasant economy

If shame about weeds is indeed indicative of the farmers' mode of life, to what underlying structure does this correspond? Ever since the Soviet agrarian economist Alexander Chayanov published *The Theory of the Peasant Economy* (1986 [1925]), ethnographers around the world have confirmed the basic idea

that the peasant economy is organised fundamentally differently than capitalist enterprises (Netting 1993; van der Ploeg 2008, 2014).

Once Chayanov's work appeared in English in 1966, an economic theory was at hand to explain the curious fact that, across different continents and ages, peasants seemed to share 'an intimate and reverent attitude toward the land; the idea that agricultural work is good and commerce not so good; and an emphasis on productive industry as a prime value', to use Robert Redfield's (1956: 112) classical anthropological definition.[10] The reason was, according to the Chayanovians and the various Marxist thinkers (Althusser and Balibar 2009 [1965]; Godelier 1972 [1969]) who also began proposing economic theories in the 1960s, that the family farm constitutes its own distinct *mode of operation*—one that is ultimately aimed at its own reproduction and not at abstract, capitalist concepts like capital accumulation (Narotzky 2016: 304)

One farmer provided an example of this ethos when he told me about his own father who had continued to plough for him almost to the time of his death (Interview 1). His father started early in the morning and drove until noon. Then he had lunch and slept for an hour. In the afternoon, he ploughed for another hour. When he was 94, he ploughed 200 hectares for his son. Farmers get old, the son reasoned, because they are used to moving around, 'being physically active and not retiring and sit down in the armchair. Then you die. I think so. Keep myself going'.

In a testimony given to the Folklife Archive in Lund, one eighty-year-old woman born on a farm in Skåne in 1912, similarly, wrote that,

> The smallholders (*småbrukare*) and large farmers (*storbönder*) that I got to know all had the thing in common that they were tremendously hardworking and frugal. Often the farm had been inherited for many generations. For them, it was a point of honour to run the farm so they could leave it to their children and grandchildren. Being a peasant (*bonde*) has always been, I believe, a FORM OF LIFE (LUF 21298: 1).

[10] Eric Wolf describes the world view that follows from this kind of domestic economy as follows: 'The peasant utopia is the free village, untrammeled by tax collectors, labor recruiters, large landowners, officials. Ruled over, but never ruling, they also lack acquaintance with the operation of the state as a complex machinery, experiencing it only as a "cold monster." Against this hostile force, they had learned, even their traditional power holders provided but a weak shield, even though they were on occasion willing to defend them if it proved to their own interest. Thus, for the peasant, the state is a negative quantity, an evil, to be replaced in short shrift by their own "homemade" social order. That order, they believe, can run without the state; hence, peasants in rebellion are natural anarchists' (1969: 293–4).

According to this informant—who was a teacher in a 'purely agricultural village' towards the end of the 1930s—those who cultivated the lands were (the testimony is from 1993), somehow, different from the rest of society. When farmers are portrayed in the media as whining, she argues, this is due to 'ignorance and thoughtlessness'. 'Surely, artificial fertiliser and pesticides have been applied lavishly', she goes on, 'but on this point much has been improved as we have all been informed about the damaging effects of these means' (LUF 21298: 1).

Not only do we find the ethnologist's vocabulary shared by the informants, but this quote also brings out the two dimensions of the peasant form of life: economic strategies and the concern for the possible heirs. Taken together, this emic statement and Højrup's etic analysis of peasant freedom point in the direction of kinship.

Just the fact that family farms in Scandinavia are called 'kin farms' (sw: *släktgård*. da: *slægtsgård*. no: *slektgård*) points to the intersection between kinship and production (this link is the topic of Chapter 4 and 5). The farm was many things in one: It was home for the living who ate and slept there and for their ancestors who had done so before. But it was also a business, an ecology, and, finally, a machine house. The old carpenter's workshop of the old peasantry had been replaced by huge structures; steel beams were covered with steel plates. Under the tall ceiling stood the machines: a plough with dozens of shares, a harrow, a combine harvester. Some even had a beet lifter of their own: an immense, clumsy machine which works with great precision to pull the beets from the depth of the soil up into the open air where they could be transported to the factory. Tractors, of course, were the most important machine in that they put all these tools into use. The larger the estates grew, the bigger the machines became.

If the goal is reproduction, several economic strategies might be available. In their wide-ranging work, ethnologists Thomas Højrup and Niels Jul Nielsen mapped out five main ways to do so and found that they had all been adopted in Scandinavia.

Højrup and Nielsen's point was that there was still significant cultural diversity in the economic cultures among farmers, fishers and other self-employed people. The diversity does exist, but the variations on simple commodity production are not equally distributed. The backbone of Scandinavian agriculture is made up of expansive farms. Particularly on the plains, they dominate the landscape. Where the other strategies prevail, they are still in opposition to the conventional mode of operation. The informants, in any case, had all adapted an expansionist strategy. Instead of saving their way through whatever trouble came their way, they bought up as many neighbouring farms as possible.

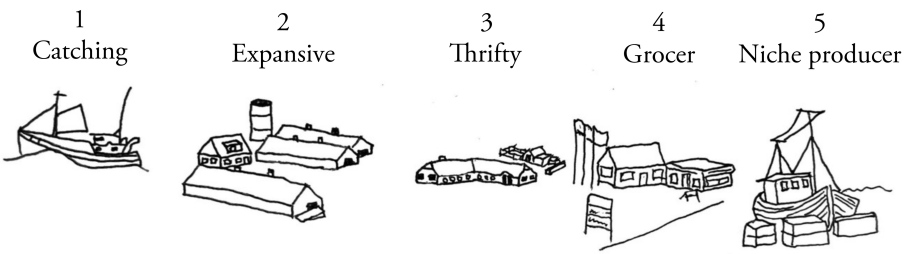

Figure 6. Five variants of the simple commodity mode of production as specified by Thomas Højrup. To make ends meet, these represent existing economic and cultural strategies for reproduction. As an independent producer, you may (1) increase output, (2) lower unit cost, (3) lower standing costs, (4) lower the price to sell more or (5) raise the price by storytelling. Redrawn by the author after Højrup and Nielsen (2024: 805).

By 2025, the farmers interviewed no longer produced anything for their own consumption. The produce of their ever-growing fields went into supply-chains reaching far beyond the villages, and the farmers went to the supermarkets to buy their groceries. To understand what these relations mean for the farmers, let us briefly look at what happens to sugar beets and the factories that process them.

A fossilised landscape and its myth

One Saturday morning in November 2023, the boiler at the only remaining Swedish sugar factory in Örtofta blew up. The explosion threw bits of brick and torn pieces of the building over the surrounding area, including the railroad tracks nearby, destroying the overhead contact lines, driving train traffic to a halt. No one was harmed, but the production of sugar shut down for a while, leaving the beets destined to rot in the factory storage and across the landscape where the beets were still sitting in the soil or piled up along the country roads in huge heaps. For the coming weeks while the rebuilding was on-going, many of these Swedish beets were taken to Ystad where they were loaded onto a ship which sailed them to one of the two operative factories in Denmark. All three factories were owned by the same company, Nordzucker, which monopolised sugar production in Europe North of the Alps. (In 2014, they were fined some hundred million euros by German authorities for colluding and cartel-making). It was an accidental interruption of production which had implications for both the farmers and the factory.

The entire harvest was at risk of rotting away on the fields.

'The explosion on the Swedish sugar factory Örtofta is a very unfortunate situation which has set the factory out of operation for three weeks', the chairman of the association of the Danish beet cultivators later wrote in the newsletter *Sugar Beet News*.

> The situation calls for everyone's understanding, as there is no way the (Swedish) factory can process the remaining beets. At the time of the accident, 25,000 tonnes of beets were in the depots which Nordic Sugar understandably sailed to Nakskov for processing. But the way forward is difficult. The Board of the Danish Sugar Beet Cultivators is not fundamentally opposed to helping, if possible, but we just don't see how we can lift more beet in Denmark now that we are already very challenged after a slow start to the campaign in the factories and a continued unstable operation. We are already looking ahead to a campaign ending around February 1st. We CANNOT accept that Danish beet will pay for Swedish beet (Frandsen 2023: 3).

Each year, the farmers on the plains of Southern Scandinavia deliver beets from around 60,000 hectares to meet the capacity of the three factories which still exist on the plains. For around one hundred days from the end of September to sometime in January, the factory runs around the clock to transform the root vegetable into crystalline sugar.

To supply the three factories, around a thousand truckloads must be delivered daily from the fields to the plants where the beets are washed, sliced into small pieces resembling French fries and left to soak in water warmed to 70 degrees Celsius to extract the sugar. The beet slices are pressed, leaving the plant to be used as fodder or biofuel. The raw juice is cleansed with chalk and carbon dioxide. The thin juice that remains at this point contains around 14 per cent sugar. The task now is to evaporate the water to leave the dry sugar crystals. This is done in two steps. First by boiling until the juice has reached 70 per cent sugar, at which point, it is called 'thick juice'. This is then placed in a vacuum cooker to evaporate the remaining water without burning or caramelising the sugar. At this point, the crystallisation can begin by the addition of icing sugar which creates a thick mass that is centrifuged, boiled, centrifuged, and boiled again until no more sugar can be extracted from the substance. The sugar is scraped out, sieved, and left to dry.

Around 2018, the situation became politically untenable. The reaction came about after a decade of mounting pressure from researchers that prevailing systems of production were far removed from what was called the 'safe operating space'. Earth system scientists proposed the term 'planetary boundaries' to illustrate that

on a series of different issues, humanity was living beyond its means. When originally proposed by environmental scientist Johan Rockström (et al. 2009), the list consisted of seven planetary boundaries concerning climate change, biosphere integrity, land-system change, freshwater use, biochemical flows, ocean acidification, and ozone depletion. Then, it was estimated that two of the boundaries had already been crossed: biosphere integrity, that is, the collapse of biodiversity, and biochemical flows, above all through the immense application of nitrogen fertilisers. By 2023, two new parameters had been included (atmospheric aerosol loading and 'novel entities'). At that time, it turned out that six of the boundaries had been crossed. 'All of the framework's individual boundaries therefore adopt Holocene conditions as a reference for assessing the magnitude of anthropogenic deviation', as one article from 2023 put it (Richardson et al. 2023: 2).

In removing humanity from its safe operating space, agriculture has been a 'major driver', because it is directly tied to land-use change and therefore the destruction of habitats, the burning of fossil fuels and the application of fertilisers and pesticides (Campbell et al. 2017). For both the factory and the farmers, the emissions of CO_2 were seen, increasingly, as a problem. Whereas little concern had been attached to this aspect of the agro-industrial complex throughout the 20th century, the 2010s saw an increasingly sceptical attitude towards the handling of and reliance on carbohydrates, like coal, gas, and oil.

By 2020, all sectors of Scandinavia society had been drawn into the political ambition of becoming climate neutral sometime in the future, usually around 2050, with 2030 marking an important milestone. In pursuing these goals, national policies often followed the Paris Agreement, an international treaty on climate change signed in 2016. Its overarching goal was to keep global temperature rise below two degrees Celsius above the preindustrial level. A fossil-free society had become a political goal. But when this goal failed to materialise, some critics claimed that the green transition was a myth, on the simple count that it was not true. Others went a step further and said that the green transition, as it was then being discussed, was a myth because it was incompatible with capitalism (Malm and Carton 2024; Hanieh 2024).

Despite these allegations claiming that all the talk about the green transition had led to nothing, the myth continued to dominate the landscape with most of its institutions and social relations. As the international relations scholar Helene Dyrhauge (2021: 26–8) pointed out, the myth that Scandinavia was somehow a leader in global climate action proved able to shift its rhetoric over and over without changing the basic relations. Dyrhauge (2021: 29) concluded that 'The

political myth narrative is important for the legitimacy of the leadership claim made by governments, especially as they use the past histories of pioneership in their policy strategies'.

Two examples highlight this ideological dynamic regarding the sugar factories.

For the sugar factory, the hundreds of thousands of tons of CO_2 that left the chimneys each year as the sweet juice was boiled into crystals posed an obvious problem. The discussion was never about whether sugar factories were compatible with sustainability in the first place, but there were more technical discussions about the different imaginable routes towards fewer emissions. Perhaps the plants could be electrified to reduce the climate impact. Perhaps, the fossil energy sources could be exchanged with renewable biogas of some, usually unknown, origin.

For the farmers, the sources of climate degradation were more complex. One thing, of course, was the CO_2 which ended up in the atmosphere as a direct consequence of burning oil in the agricultural machinery, like tractors and combine harvester. But Scandinavian agriculture also contributed to global warming through other, more biological, avenues. In 2024, a Danish commission suggested a carbon tax on agriculture which had, until then, been exempted from these regulations. If it were to be implemented (there was, at the time, majority parliamentary support for it), it would make Denmark the first country in the world to tax emissions from agriculture, not just the diesel burnt by the tractors, but also the methane leaving the cattle and the CO_2 seeping out of drained bottomlands.

1. Emissions from husbandry, primarily cattle and pigs (methane)
2. Emissions from mulching of manure and chalk.
3. Emissions from carbon-rich bottomlands which had been drained and plough and not, as in the preindustrial times, kept the carbon in the soil under water (Grøn Skattereform: 31).

The transition which was in store, clearly, was a massive one, although the situation was not the same in Denmark and Sweden, nor was it considered by looking through the exact same lens in the two countries. In Sweden, which is a much larger and much less intensely agricultural country, agriculture was estimated by the Ministry of the Environment to contribute to around 13 per cent of total climate gas emissions in 2018 (Ministry of the Environment 2020: 19). In Denmark, where agriculture dominates the landscape, 27 per cent of all emissions stemmed directly from agricultural activity in 2020. The percentage,

however, rose to 38.5 when the entire value chain, from transportation to processing, was considered (Landbrug og Fødevarer 2022: 5).

Farmer responses

Whenever these questions about climate, machinery and emissions came up during my interviews with the farmers, it did not seem like an unmanageable transition. If only the tax were at the right level, the farmers would adjust to it. If they survived the first shock, they would soon enough find ways to avoid the tax. 'There may be a phase-in period of three years', one of them told me. But the tax 'must be at a level where I can say that I can do something about it. We don't plough as much as have done. We know that ploughing releases CO_2 into the atmosphere'. He reasoned that if you stop ploughing and harrow instead (which won't work for the sugar beet because it needs deep and loose soil to grow in), then you diminish your CO_2 emissions. Then you should also pay less in carbon tax. 'Isn't that the goal?' he asked rhetorically.

'That is the goal of all fees', he concluded. 'Like a fee on tobacco, it is about getting consumption down. So, I hope they can give us some instruments we can use'. But this Danish farmer, like his colleagues, understood that many people primarily understood them and their business in relation to the negative impacts they had on the climate and the environment. 'We have always been accused of polluting. And, earlier, we also have', he testified and added that,

> The farmers are frowned upon. There is nobody clapping their hands when we come driving or when we do anything. We are not a line of business where people say, 'Shut the front door, how lucky we are to have agriculture in Denmark'. It is kind of the opposite. I heard on the radio this morning with the EU debate that this agriculture—just shut it down. It doesn't benefit us! (Interview 1).

A bit later, I asked him whether he knew the Swedish peasants. He knew them very well, he told me, from visiting them many times. Thoughtfully, he told me that it is different there. Sweden is not an agricultural nation. Primarily woods and heavy industries, they import most of their food. Denmark was 80 per cent cultivated (the official percentage was 60), as critics often point out. Surely, that was true, but then again, Denmark was all plains and fertile land. There are no mountains in Denmark, he said. If we would count in Greenland, it would not even be five per cent under plough, and thus, much more wilderness. This was,

he thought, the reason why peasants are more disliked in Denmark than in Sweden.

They took up too much space.

While in one way alluring, this is only half the explanation of how the farmers are perceived by others across Scandinavia. While it is undoubtedly true that field agriculture dominates much more in the Danish landscapes than it does in the Swedish, difference in national mythologies, too, play a part in the reactions farmers meet. For a long time, agriculture was generally understood as a, if not the, foundation of modernity in Denmark. That it was through agricultural modernisation the Danes became modern is a narrative which has been passed down the generations. In Sweden, on the contrary, modernity was conceived in industrial terms as the opposite of agriculture. Only when people stopped being farmers did they become modern. In this Swedish view, it is easy to frame farmers as remnants of the old world. From a Danish perspective, farmers stood at the forefront of the modern world.

This is, of course, a gross simplification, and there is evidence that this image is beginning to change. In an analysis of the media coverage of Swedish farmers, Lars Hallgren et al. (2020) found that the traditional image of the farmer as a conservation hero was increasingly being replaced by an image of the farmer as a climate villain. My point is that although these images have a clear basis in the landscape, they must also be understood socially. But although the national trajectories have created different cultural readings of the virtues or sins of farmers, there are certain structural similarities that cut through peasant life across the region. In the postwar period, for example, agriculture was protected politically in Sweden to secure domestic food production (Flygare and Isacson 2011: 217). In Denmark, on the contrary, the main impetus was towards large-scale production for the world market (Kærgård and Dalsgaard 2014). When studied ethnologically, the peasant mode of production has as much to do with the production of people as it does with the production of things. Through their life within the economic culture of simple commodity production, the farmers cultivate themselves as independent producers.

Aksel, when I asked if there was something he wanted people to know about being a farmer in this landscape, responded in this way.

> They must know that it is a marvellous line of work, so just join us! It is enjoyable work, and I am excited to. . . I say that I make food for the Danes. No, I make food for the world. That is my mantra. We make food for the world. We make food for 15 million people, and we are only almost 6. And if

> we don't make it in another way—which I think is a worse way than our current one—then we are the best. I would say so (Interview 1).

What was surprising was just how marginalised Aksel's position had become. Along with other farmers, he stood relatively alone in his praise for this line of work. When seen from the perspective of emissions, agriculture, for most people with no relation to the land, was much less glorious and its way of producing food dubious. But behind these current contradictions, there are, I suspect, others which run deeper and are less conspicuous. A hundred years ago in Scandinavia, the political and cultural value of farming would be self-evident. Now, it had to be articulated from the margins. When the myth of the green transition spread, it was somehow the existence of factories, not farms, which was the order of the day. 'To the extent that the myths, taken collectively, have a surface ideological message or aim', the anthropologist Chris Knight writes,

> it is the achievement of moderation and balance in all things—the definition of what is 'excessive' depending, of course, on the conceptual system being used. Models of balance and harmony in social life are shown against a backdrop of various expressions of extremism or excess (1995: 494).

It was the sugar factory which provided the model of balance and harmony on the plains. At the end of the day, the pipeline to the sugar factory was built while the Scandinavian peasantry continued its death spiral, as it had for a lifetime. When a factory breaks down, it is rebuilt. When five hundred thousand family farms shut down, they are forgotten. It is a testament to the power of the myth of the green transition that there was never even the shadow of a political movement to ask whether, after all, this money could instead be used to help the peasants out of their fossil mode of operation and relieve the planetary shame which the science of the Anthropocene imposes on the landscape. Where on earth did this idea—that of all things, it was the welfare of the factory which had to be accommodated—come from?

2 *The first wave of fossilisation*

From its beginning, sugar beet was an industrial crop in Scandinavia. The steam plough, a 19th-century fossil innovation, was initially used almost exclusively to plough Scandinavian fields where sugar beets were grown. I will now turn to the origins of sugar beet cultivation in Southern Scandinavia. But first, the history of the plant itself will help us to appreciate where on the scale of historical time we are to begin our ethnological genealogy.

Scattered across the beaches of Western Europe and the Mediterranean, there is a plant which has been collected for human consumption for thousands of years. It is not unlikely that hunter-gatherers ate it before the rise of agriculture. With its thick, glossy leaves, the sea beet was a popular wild source of food. Halfway into the Holocene (sometime around 6,000 BC), it was transferred from beaches to gardens and cultivated by people in the Near East, and later across the Mediterranean (Biancardi et al. 2012). After more than five thousand years of a relation between the domesticated beet and gardeners, something resembling a modern beet root appeared in the archaeological record. The initial flecks of dark red had now taken over the whole plant and the whole root had grown considerably.

Throughout the Middle Ages, monks further developed the beet into different varieties. Some, like the *mangelwurzel,* were grown as fodder for animals. Others were refined for human consumption. French chefs had been observed to make sweet syrups of them. In the mid-1700s, a German pioneer of analytical chemistry called Andreas Marggraf demonstrated that the sugar contained in the beet was identical to that of sugar cane which had already, by the time, acquired intense political and economic importance, not to mention the human suffering it had caused in plantations overseas.

Through selective breeding, sugar contents of around 5 per cent had been raised to nearly 20. From 1800 to 2020, the sugar beet had become as important a source of sucrose as cane globally. One reason why it needed so much tending to in the absence of pesticides was that it competed very poorly against other species. It was a low growth, originating on the beaches where few plants could survive and had adopted an evolutionary strategy which did not include overshadowing its competitors, much to the dismay of the modern farmers who

cultivated it. In the absence of pesticides, they had to find a way to keep the weeds at bay.

But how could you when the people flee the fields?

Figure 7. The different types of cultivated beets accumulate carbohydrates different. Whereas the wild ancestor Beta maritima (left) is a scarce plant, leaf beet directs the energy to the leaves (second from left), while the sugar beet (middle), the garden beet (second to right) and the fodder beet (right) accumulate carbohydrates in the root itself for human or animal consumption. Redrawn by the author after Biancardi et al. (2012: 226).

Gustav Adolph Hagemann was the man who formulated the definitive answer in Scandinavia. Beginning his career as a scientist, he later became a leading, if not the leading, industrialist who, perhaps more than anyone else, was involved in the development of a large-scale sugar industry in Scandinavia from the 1870s onwards. At that time, capitalists had already begun to exploit the possibilities provided by the winds of liberalism blowing over the European continent. Swiping away the last remnants of the feudal order—guilds, fiefs, and copyholding in agriculture—Freedom of Trade Acts (1857 in Denmark and 1864 in Sweden) opened 'free markets' for selling and buying practically anything: fertilisers, food, pins, machines, sugar, coal, and labour. It became the age of companies, particularly stock companies.

Backed by prominent capitalists who were already engaged in fossilising the Danish economy by forming what they called 'rings' (it was actually a series of monopolies to suffocate competitors) in different sectors, he had spent years researching the elements one needed to combine to turn the agricultural landscape into a machine for the collection of profits: commercial fertilisers, consultants, railroads, steam engines, factories, even migrant labourers all played a central role around the sugar beet, which was playing the leading role in this multi-species

drama. It would act as a kind of trojan horse through which capital would penetrate the self-reliance of agriculture to overthrow the old neolithic order.

Luckily for this historical analysis, Hagemann also wrote agitating pamphlets (1875, 1885, 1915) to convince others that change (which somehow always involved fossil energy) was necessary. I found them to be a good source in portraying a man who, perhaps as much as any other individual, was involved in unleashing the fossil revolution in Scandinavia. The format itself forces the author to make explicit how he sees the world, and what aspects of it need changing. While not necessarily covering how things worked on the ground at the time, what pamphlets document precisely is ideology.

In one of them, Hagemann (1885: 8–9) wrote that 'Sugar beet is brought into the ordinary crop rotation in such a way that it can neither reduce the grain area nor the grass crop on which the livestock's summer nutrition depends'. Instead of replacing other crops, it 'is taken in place of the parts of the fields that in the ordinary extensive operation 'rest' or are used for low-paying crops (fallow land and the perennial pasture)'. Fallow and pasture, it would seem, are parts of the land which are sleeping, and thus not playing the role they might. But to work, the new system without fallow required 'a very deep and energetic treatment of the soil, and even, during summer, a treatment between the plants by hand and horsepower, whereby the soil is kept loose and porous, and the weed seeds are made to germinate and destroyed'. This labour-intensive work of keeping the beet fields orderly, Hagemann (1885: 9) reasoned, 'has quite the same influence on the crop rotation as fallow and leaves the soil loosened to a great depth, free from all weeds, and by the richness of leaves and roots, enriched with humus'.

To succeed the sugar beet required a very abundant supply of fertiliser. As we will see, the sugar factory would supply the farmers with this. At first, this abundance was sourced from various overseas sources, some chemical (potassium nitrate), others biological, for example, guano. Later, this would wholly be replaced by artificial fertiliser produced through the Haber-Bosch process, which was itself a highly fossilised product which involved burning coal to melt the nitrogen in the air and capture it in solid form that can be transported around the world.

'In this way', Hagemann continued, the sugar beet,

> becomes the means for a very intensive use of the soil and for the soil, and for the transition from the ordinary operation to the intensive, actual *vexeldrift*, a crop rotation in which regular alternation between long-stemmed and narrow-

> leaved plants and a suitable area of 'chop fruit' (beet) can completely do without fallow and the 'rest' of the soil (Hagemann 1885: 9. Emphasis mine).

To shake the soil out of its 'sleep' was, from the beginning, a measure of just how rational, effective, and therefore also moral, the cultivation of sugar beet was. The energetic treatment of the soil required by the beet reflected well Hagemann's own temper.

Since his childhood, he had found himself at the centre of things. One biographer claimed that he inherited this trait from his mother, who was also observant, industrious, and energised. His father Otto Waldemar Hagemann, on the contrary, was an old aristocrat who slept until 8.30 in the morning on the manor which he had bought at age 26 (Vinding 1942: 18–19). Whereas the father spent his waken hours jotting down the accounts of his estates in gothic handwriting in German, the son Gustav Adolph travelled to Copenhagen to study at the Polytechnic Institute. There, he was initiated into a class of engineers whose supreme belief lay in progress. Drawn out of the feudal arrangements into which he was born, he spent his days combining science with economic rationality, reading about the most recent developments in England and France. As the plan of a fallow-less land developed in his mind, the ecological question of the fallow was viewed from an international perspective. 'No one', Hagemann reasoned,

> can, without punishment, year after year take crop after crop out of the soil without full repayment, and one of the main reasons why conditions in Ireland are as bad as they are at present is, undoubtedly, that the soil has been gradually impoverished to the degree—perhaps forced by unfavourable tenancy conditions—that it is no longer capable of supporting the current inhabitants (1885: 5).

He found support for this position in his international outlook which allowed for theoretical comparisons between different systems of land tenure and modes of operation in place elsewhere. 'It is interesting to see a contrast to the above-mentioned depletion in the conditions in China, where an ancient law has forced the peasant to cultivate his field with the help of row sowing', Hagemann wrote.

> The distance between the rows is determined by an official appointed by the government in such a way that if the disposable manure heap is large and of good quality, he is allowed to put the rows closer together, but if it is small and of poor quality, he must spread the rows further apart, and in this way it has

> been possible for China not only to preserve, but to increase its soil wealth so that it has gradually been able to support a population which we commonly call an overpopulation (1885: 5).

By the time he turned 30, Hagemann had already accomplished many deeds either in fossil or colonial contexts, and most often both. In Chapter 3, we will take a closer look at the strange link tying colonialism to fossilism. This link is materialised nowhere as clearly as in the crystalline structure of sugar which offers cheap calories, arriving from what seems to be nowhere, first to the colonial people and since to the fossil people. From the beginning of the colonial period, sugar was *the* fetishised commodity. Even as Europeans became increasingly addicted to it over the centuries, 'much about it', the anthropologist Sidney Mintz (1985: xxiii) wrote a century later, 'remains obscure, even enigmatic'.

For Hagemann, however, the veil lifted on these mysteries.

As a child, he spent an entire year in bed after having contracted tuberculosis in a bath house. The sickness spread to his vertebrae, leaving him with a back deformity he lived with the until his death. Although this forced him to wear a back harness at times, this disability put some lucky cards into his hands. During the 1860s when he was studying engineering in Copenhagen, a war broke out between Denmark and Prussia over the border region. Most able-bodied men were drafted to the army and sent off to the battlefields of Schleswig and Holstein, including most of the students in Hagemann's class. A friend of his who had already graduated and begun to work for a cryolite factory in Copenhagen, too, went off to war. When he was captured by the Germans, the owners of the factory asked the teachers at the Polytechnic Institute for a replacement. With almost all the students on the battlefields, Hagemann was appointed. Later, he graduated with excellent grades (much to the excitement of his old aristocratic father) and was asked immediately to oversee the reorganisation of the cryolite production.

Cryolite is a mineral which was only known to exist in a single mountain at the end of a fjord in the Danish colony of Greenland. The Inuit had long known about this rock, which looked like ice when submerged in water but had no other use other than chewing it as a kind of snuff. During the 1800s, German and Danish scientists had found out that the material could also be used in the production of soda, which was a necessary step in the industrial manufacturing of aluminium. What the leaders of the factory wanted was for Hagemann to travel to the United States to learn about how they processed Greenlandic cryolite there. Then he was to take and analyse samples of it. This was a step in the larger plan of taking control over the entire value chain from extraction in Ivigtut, Greenland,

to shipment to Denmark and processing in the factory in Copenhagen. When he was asked to take on the task directly following his exams, Hagemann said that he would like to if his 23 years of age, his total inexperience in all fields of trade, his ignorance of English and his bodily insignificance did not appear to the directors to be in 'too little harmony with the great assignment' (Vinding 1942: 49). Later, because of his work with analysing the minerals that cryolite was composed of, one of these was named 'Hagemannite'.

After four years in America, he continued to impress the owners of the factory with his ability to get out of technical troubles. Especially C. F. Tietgen, a prominent financier who is often celebrated as a kind of Scandinavian Rockefeller and then acted as the chairman of the factory, was impressed with Hagemann. Tietgen was the one who established monopolies in many sectors from steam shipping to telegraphy and labelled them 'rings'. In the case of cryolite, he had used his considerable political leverage to pave the way for colonial extractivism in Greenland: 'These hard years of work meant a great deal for Hagemann's own development', his biographer wrote,

> and contributed to shaping the measure of people and values which characterised his later life. He never became an admirer of the Danish society to which he returned in 1870. He found it completely idiotic that all economic and practical endeavours—especially those of the peasant—was despised and that only artistic and aesthetic formation was the order of the day. 'No wonder', he himself says, 'that I joined the budding liberal ideas' (Vinding 1942: 81).

By themselves and others, Hagemann and Tietgen were considered very 'English'. Despite this liberalist inclination, Tietgen was convinced that the precondition of a domestic sugar industry was another 'ring' which had to include both sugar beet (which was not really cultivated in any significant degree then) *and* cane sugar from plantations in the West Indies. For centuries, sugar molasse had been shipped in from the colonies to be processed in the factories in Copenhagen. When Tietgen and his associates formed a stock company, *The Danish Sugar Company*, the goal was to subsume the colonial and domestic sugar into one hierarchical corporate structure.

In their 'English' world view, progress in agricultural affairs was not just an economic issue, but also a moral one. The plan of a sugar ring would benefit not only the investors at the stock exchange in Copenhagen, but also the peasants who, at that time, still made up most of the population both in numbers and in political ideology. Hagemann explained it in this way.

> Finally, we should only mention the moral influence, of every culture, especially the root culture. The farmer is easily lulled into calm in the usual notions, but now comes a crop culture that requires great care and consideration, the farmer is brought out of his from his accustomed tranquillity, and through the factories to which he is related, he comes into contact with the of chemistry and mechanics, and with managers who, educated in the sciences, are peculiarly fitted to set his thoughts in motion. And the effects are progress in the development of the mind and the diligence (1885: 19).

This kind of development of the mind was not only preferable to the laziness of the old ways. It was imperative that the peasants be exposed to science, to new forms of management, and to fossil fuels. Under the threats of economic and ecological collapse as well as population problems, there was, he reasoned, no real alternative to the fossilisation of agriculture. 'For it is on the proper utilization of the fathering soil that our entire future depends, and there is much to be done'. With this sense of urgency, he noted that, in many places, the 'soil wealth' had already been depleted. It is now lying at a low rate of interest. Sugar beet and a land without fallow would be the obvious way to make the most of the land which, after all, was capital. 'That the land is the farmer's natural savings bank, into which he should deposit his earned surplus to obtain a many times greater interest than the saver in the form of increased folds, of this', he wrote, 'there can be no doubt'.

Above all the new morality links economic rationality to population politics. Hagemann saw economic growth and agricultural intensification as welfare politics, but as we will see later, not everyone agreed with him.

> What effect this may have has been shown by the examples given; let us hope that in this direction China will be taken as a monster and work towards an increase of land wealth by means of an ample compensation for the land. The effect—a strong flourishing agriculture—will then not fail to appear. Without this, as the statistics have clearly proved, Denmark will no longer be able to feed its growing population in the year 1900 (Hagemann 1885: 19–20).

Hagemann's plan was to develop a vast system of railroads, pipelines, and factories to connect the sleepy farmers and their fallow land with a centralised factory. The plains of Southern Scandinavia, first left fertile after the glaciers retreated and since dominated by the combined powers of the sword and the book, were about to be

colonised by fossil capital. The central factory system was going to be Hagemann's most lasting imprint on this landscape.

The origin of pipelines

To understand how the arrival of sugar beet changed the landscape and life for the people in it, I will have to describe the moment of transition. There was a before and an after the arrival of sugar beet in Scandinavia. The Danish Sugar Company had its headquarters situated right on the canal in Copenhagen. In 2024, the four-storey warehouse had been abandoned by the Sugar Company for some time. It then housed offices for consultants and investment companies. Right across the canal lay the reading room of the National Archive. A cardboard box entitled 'the beet fields of the breeding farms, no 214' documented some changes in the landscape around the first sugar factories in the years from 1882 to 1934. Already in 1885, the largest factory had a capacity of 600 tons of sugar beet (Sveistrup and Willerslev 1945: 26). During the four or five months, 77,000 tonnes were processed in Nakskov which was, and remains, the sugar beet capital. To satisfy the factory, therefore, Hagemann and his managers needed more than five thousand hectares of fallow land in the vicinity of Nakskov to be turned it into beet land. This immediately gave rise to a problem. How to transport hundreds of tons of sugar beets many kilometres every day?

Hagemann's solution became to build so-called pumping stations out in the landscape. Located 10 or 15 kilometres from the factories, they connected factory to field through pipelines through which the juice of sugar beet was pumped. For a lifetime, the beet tracks remained a vital component of the sugar industry. Until the age of trucks, no sugar factory could hope to be supplied with beets without them. As late as 1943, a Danish geographer, Aage Aagesen, concluded that 'the beet rails transport so significant amounts of goods that they in certain parts of our country occupy a remarkable place among the means of transportation' (1943: 9). At the time, the beet tracks were still in place and provided 'a kind of door-to-door transportation' because the tracks were so light they could easily be redirected to reach any part of the hinterland.

> There is every reason to believe that the beet track will continue to play an important role in transportation in the sugar beet growing parts of our country, as experience shows that while cars cannot meet the need for transportation under difficult conditions, the beet tracks retain their importance almost unchanged in good and bad times (Aagesen 1943: 2).

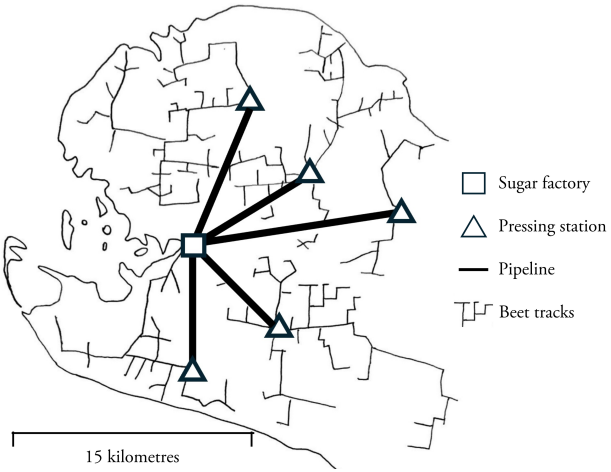

Figure 8. Map of Western Lolland with Nakskov sugar factory and pressing stations spread out in the landscape. From these pressing stations, small railroads were laid out into the landscape. These were so small and light that they could be easily rearranged to reach new fields where sugar beet was grown. The result was an infrastructure to tie together field and factory. The factory in Nakskov was supplied through five pressing stations by the landscapes in a radius of 20 kilometres. Redrawn and elaborated by the author from Aagesen (1943: 2).

But how, then, did the whole thing work in practice? The archive of the sugar factory provides some answer. Consultants were sent out into the vicinities of these pressing stations to convince farmers to take up beet farming instead of tending their fallow lands. In the 'Plan for the activity of the agricultural consultant of the Sugar Factory of Nakskov', their work was specified. 'The consultant', an internal memo read, 'by frequent personal intercourse and in other ways that he may find appropriate to the purpose, seeks to influence the farmers in the hinterland of the factory'

> The consultant must assist in all questions about the cultivation of sugar beet concerning guidance, enlightenment, and influence, to
> - engage and expand the cultivation of beet,
> - incorporate this in the crop rotation in the best way possible,
> - benefit fully from the creatures through appropriate demands,
> - benefit most of the culture by appropriate application of fertiliser, treatment of the soil, good caretaking of the beet field during the period of growth and so on (De Danske Sukkerfabrikker 1882–1934).

Once contracts had been drawn up and signed, the consultant had to keep an eye on how things were developing on the ground. Were the fields weeded sufficiently for the beet to find optimal conditions of growth? Did the farmers live up to the conditions of the contract? If that was the case, cash advances could be paid but only 'when the consultant can show certificates for the size of the area and that the beet field is in satisfactory condition concerning cleaning and thinning'.

The enormous amount of labour involved in keeping the beet field clean and tidy—to the satisfaction of both the farmer and the consultant—meant that not all had the same possibilities to expand beet in the place of the fallow. According to the leading historians of the Danish sugar industry, the devotion to beet corresponded directly to the size of the estate. Crofters and other smallholders with only a few hectares of land devoted the least of their attention to beet, while the large manorial estates with hundreds or thousands of hectares of land embraced the new industrial crop most enthusiastically. In a work whose title translates as *The History of the Danish Sugar Trade and Production,* Sveistrup and Willerslev (1945: 216) offer the following chart to illustrate this point.

The size of the property in *hectares*	**Area cultivated with sugar beets in** *per cent*
0–4	0.8–2.6
4–64	3.0–3.4
64–128	6.1
More than 128	11.6–15.7

With the theory of fossil capital fresh in mind, I soon concluded that the reason for this unequal appetite for sugar beet was more social than technical in nature. Just like those beet growers today who shift to organic cultivation, the main issue in the 1880s was how to care for the beet fields. Contrary to grains, the sugar beet needed a great deal of weeding. The manorial estates that already were reliant on externalised labour were, in this regard, at an advantage both practically (they had to have some access to labour power) but perhaps also culturally. They knew what it meant to command whereas the crofters, crudely put, did not. The more hierarchical the starting point, I thought, the more hierarchical the result.

But how did all this transform the landscape on the fields? Did it shake the soil out of the sleeping fallow, as Hagemann had dreamed?

The rise of sugar beet

Some years earlier, on October 22nd, 1872, to be precise, the residents of Maribo not far from there, gathered around the Western edge of town to witness a remarkable spectacle. Around midday, according to the local newspaper, two steam ploughs came steaming down from the North where they had been shipped to a little port from Fowler's in Leeds, England. 'The machines were driven with much ease along the country road', wrote the paper Lollands Posten (as cited in Boyhus 1976: 26), 'and although they with coal, water, and remaining apparatuses weighed about 30,000 pounds each, they moved with remarkable lightness over the uneven cobbled road as well as over newly macadamised roads'.

As this was the first steam plough to arrive to Denmark, allow me to elaborate a little on the background and why it matters to us. Before Hagemann's plan of a factory connected by pipelines and consultants to an entire landscape, the plough had been born by another aristocrat with industrial ambitions. Erhard Frederiksen was the oldest son and heir to an estate of almost 300 hectares, thus making it one of the smaller of the aristocratic estates, but still ten times the size of an average farmstead. His father died when Erhard was 18 and just two years later, newly graduated from the Royal Danish Agricultural College, he took over the management of the ancestral estate for his widowed mother. Going on a series of study trips to Germany, England and Scotland with his brother, he was intent on building a sugar factory on Danish soil.

After some decades of experimenting with the prospect of applying steam power to agriculture in Britain, in 1858 *The Economist* could finally state that 'The question of the practicability of steam cultivation has been solved' (Ahmed 2023: 187). An engineer and a Quaker, Sir John Fowler had cracked the code and was rewarded £500 by the Royal Agricultural Society. 'He became "steam cultivation" personified' (Ahmed 2023: 188). From his travels, Frederiksen came across this system and saw that much land could be freed if they no longer had to provide fodder for the draft animals which the steam plough would render superfluous.

In Lolland, two stokers fed the machine with coal. A third man drove the plough which was pulled between the two machines through a series of iron wires. It ploughed and loosened the soil to prepare it for the demanding beet. Whereas the old heavy plough turned the soil to the depth of 12 inches, the steam plough reached as deep as 14 inches (Frederiksen 1892: 162). 'With the introduction of steam cultivation', Frederiksen (1892: 163) wrote, 'a significant progress in the yields of root vegetables (and the following crops) has been observed, something which has been ascribed to a more fully completed depth-culture'.

While the steam plough began working the lands from the winter of 1872, Frederiksen oversaw the construction of a factory in Holeby. Faced with difficulties in finding beet contractors, he and his brother resorted to supplying themselves with the beets they needed. 150 years later, I found records in the National Archive of Denmark from this estate document in the crop rotation before and after the arrival of sugar beet. Because they show how the arrival of fossil energy changed the relations to the landscape, let us look at them in greater detail. After the arrival of the steam plough but before the factory was constructed, the field plans show that the old mode of operation—usually called the 'Holstein System' (*kobbelbrug*)—was still in place.

	FIELD NO. 1	NO. 2	NO. 3	NO. 4	NO. 5	NO. 6
1873	*1st year clover*	Oats and barley	Barley and peas	Winter wheat	*Fallow*	*2nd year clover*
1874	*2nd year clover*	*1st year clover*	Oats and barley	Barley and peas	Winter wheat	*Fallow*

Table 3. Plan of operation for Højbygaard, Lolland with crops that restore soil fertility in *italics*. Assembled by the author from De Danske Sukkerfabrikker (1882–1934).

In this form of operation, the breeding of animals and the cultivation of plants in the fields remained mutually constitutive. The fallow lands were the ecological cornerstone of the whole rotation, followed by two years of clover which had the dual function of restoring fertility to the soil by fixating nitrogen and providing fodder for horses and cattle. These, in turn, provided a continual flow of energy in the form of manure. Only three of the six fields, therefore, produced direct use values for human consumption. But the rest of the fields, which either lay fallow or produced crops for animal consumption, maintained a closed ecological system in which the energy needed to draw the plough circulated locally. Over a couple of years, sunlight materialised in the plant biomass by photosynthesis, fuelling the horse which created manure for the landscape.

A couple of years after the arrival of the steam plough, Frederiksen witnessed the first sugar leaving his sugar factory in January 1874, but things did not go so well after this. Building the infrastructure necessary had strained the brothers' economy. They reached out to Tietgen, Hagemann's employer whose access to financial capital was unchallenged, trying to convince him to provide loans to get

over the tough start. Intent on carrying out his own plans with Hagemann—plans that involved forming a national monopoly—he rejected his competitors.

In 1877, Lolland Sugar Factory went bankrupt.

But this was not the end of the factory. Tietgen and Hagemann's sugar company bought the bankrupt estate and integrated it into their 'ring'. Erhard Frederiksen, on his part, was employed as a technical consultant under Hagemann. It was in that function that he authored the guidelines for the agricultural consultants that was sent out into the landscape with the above-mentioned aim of expanding beet cultivation.

At the National Archive, the field plans resumed in 1880 when the estate was now a part of the national monopoly. The same steam ploughs were still there and continued to till the land for some more decades, rendering its fossil services to the sugar ring.

	FIELD NO. 1 200 ACRES	NO. 2 200 ACRES	NO. 3 200 ACRES	NO. 4 200 ACRES
1880	Sugar beets	½ Wheat ½ Spring grain	½ Legumes *½ Clover*	Barley
1881	Barley	Sugar beets	½ Wheat ½ Spring grain	½ Legumes *½ Clover*

Table 4. Plan of operation (*driftsplan*) for Højbygaard, 1873–74 with the crops that restore soil fertility in *italics* (De Danske Sukkerfabrikker, 1882–1934.). Assembled by the author.

With the factory in place, now under Hagemann and Tietgen's control, a landscape without fallow was born.

Frederiksen had noted two advantages of the introduction of sugar beets into the landscape. First, sugar beet represents a significant increase in the production of 'valuable organic matter' because it replaces the fallow, which represent reproduction rather than production. Second, sugar beet is 'the means to a very economic and intensive use of the soil and an effective bringer of culture for the following crops' (Frederiksen 1892: 1). Proper cultivation of sugar would spill over into the adjacent crops in an increasingly intensive mode of operation.

Tending to 200 acres of sugar beet field according to the conditions set out by the contract meant that many hands were needed. The cultivation of beet was a kind of horticulture on a plantation scale. The same problem which faces

cultivators of organic beet today presented itself to Hagemann and his contractors: how to source the labour necessary to weed and thin the endless rows of beet, two or even three times per season?

A journey to the pressing station

As the first-born child in a peasant family, Jens Madsen grew up in the 1880s on a family farm with 29 hectares of arable land in Lolland. When he eventually got a place of his own, he grew the usual crops: wheat, rye, clover and, of course, sugar beet. There were also some horses and some cows whose milk he sent to the local dairy, where it would be processed into cream and butter and sent out into the world, more specifically the breakfast tables of England, as was the case for Danish dairy generally (Lampe and Sharp 2018). The following reconstruction of the links between the peasants and the sugar factory is largely based on his accounts in the folklife archive found under the attic at the National Museum in Copenhagen.

'Around October 1st, a message came from the sugar factory in Nakskov saying that the beet had to be delivered in a railroad wagon to Søllested Station', Jens Madsen remembered. 'Usually, one wagon per week until one had finished' (NEU 14,726: 28). A few days before delivery, the people had begun to pull the beets from the ground. 'The blacksmith was engaged to produce a heavy iron tooth that could go beneath the beets and lift them out of the ground with aplomb'.

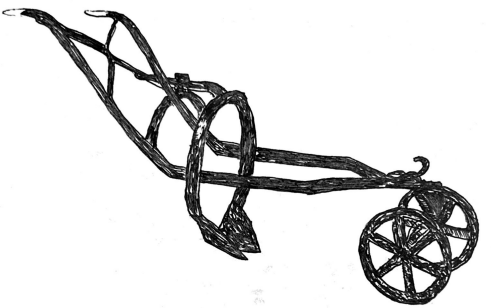

Figure 9. Beet lifter. Redrawn by the author after Snedker (1973: 96).

'It was an iron hoop with screws mounted on an older plough beam with a handle and draft gear'. Drawn by two horses, 'one could plough the beets loose so that they could be pulled up'. A whole variety of local inventions were made to accommodate this problem. Some used the frame of old wooden ploughs. Others transformed an iron plough with small wheels, and one even had a little seat allowing the ploughman to get comfortable when he directed the workers

(Snedker 1973: 107). Jens Madsen remembered that 'One ploughed 10 rows at a time, then placed the beets in a circle of 3 alen across (1.88 metres), with the tops facing outwards; afterwards, the tops were cut off and the cleansed beets were placed in the centre' (NEU 14,726: 28).

Figure 10. Beet fork. Redrawn by the author after Snedker (1973: 95).

Having received notice that the beets had to be delivered, they 'were loaded onto a box wagon and driven to Søllestad Station', from which they would be taken on train to the local pressing station a couple of kilometres away. On the way, they would pass by the two other farmsteads in the village of half of the eleven houses were the crofters lived. The hectare which had been cultivated with sugar beet following the contract with the factory lay around six other fields, each measuring around 8 barrels of land. The soil was heavy clay.

Between each of the seven fields, willow trees were planted. Each year in the month of March when spring was just about to arrive, the men cut down the 'neatest and smoothest twigs' (NEU 14,726: 2). The blacksmith had prepared a 'willow drill' which was driven into the ground to make way for the twigs. Soon after, they would take root and after about six years when they had grown just over two metres tall, the men would begin to cut down its twigs, forcing it to grow sideways rather the upwards. In this way, the characteristically Lolland-type hedges formed around the arable fields.

The multifunctional nature of these hedges deserves a few more words, as they illustrate how the shift from renewable to fossil energy had implications both in the field and in the kitchen. Stretching from one willow tree to the next, the earth had been piled up about a foot. The strongest twigs would then be driven into these elevations vertically to create support posts, or rods (*stavre*), between the trees. From a ladder, the farmhand cut down the twigs and handed them to a hired crofter (*husmanden*) who drove the support poles into the ground, while it was the job of the boy (*drengen*) to braid the horizontal grid that would finish the hedge. In some parts of the plains where forests were far between, apart from keeping the animals out of the fields, the willows also provided all firewood used for cooking throughout the year (NEU 14.726: 6).

Figure 11. A hedge between the willows like this one had two purposes. It kept the animals on the fields where they were supposed to be, and it provided all the firewood needed for the household year-round, even in areas where all forest had been felled. Photograph from Thorsen 1988: 84).

This is a significant point. On the largely treeless plains, willow hedges between the fields served many purposes. They both kept animals out of the fields and provided fuel for the house. As such, it was an ingenious adaptation to the ecology, but it also locked the system of cultivation in certain ways by keeping fields small and separate. Only when new sources of energy could be harvested from beyond the local landscape to be used in the hearth and when large plots of land became viable through a reorientation of specialised and mechanised land use (see Chapter 5), did the willows lose their function as a mediator between field and hearth. Before that, they stood as a symbol of a versatile landscape with its markedly gendered division of labour (see Chapter 4).

The ploughing cycle largely followed that of the willow trees and the fences, as there were six principal steps in this pre-fossil mode of operation. After the

fallow, when the soil was the most fertile, followed wheat or rye sown in autumn. Having a growing season that stretched through the winter months, the crop could be harvested already in early summer. Then, some months later as the days were growing shorter, the field was ploughed again and left for the following winter. In spring the two following years, barley and oats were sown. During the fourth and fifth year, the same field would lay with grass—usually clover or another nitrogen-fixating crop with nutritional value for the livestock. Then, at the sixth year, the fallow returned bringing the necessary 'rest' to the soil. To this six-year cycle of the 29 hectares, the entire metabolism of the people and the farm animals was tied. For a farm of that size, around 10 people would live together with around 4 horses, 8–10 cows, a couple of sheep and some pigs (Boyhus 1976: 35).

Passing by these fences, which the livestock sometimes destroyed by scratching themselves on it, the wagon loaded with beet moved westwards down the road to the railroad station. Behind the willow hedges of the neighbours, the land was still divided into seven or eight fields, separated by a trench into which the excessive water ran (NEU 14.726: 13). The one that lay fallow was ploughed two or three times during its resting year to prepare for the coming one. Beside it, the rye field had been harvested. So had the barley field behind, but the four cows were still out on the pasture next to the clover field.

At the railroad station, the beets 'were loaded with a beet fork onto the rail wagon, which could hold 9 box wagon loads' (NEU 14.726: 29). On each of the many daily trips back to the field from the station on the delivery season, the wagon would be filled with the dry beet material from the sugar factory. 'The pulp was good fodder for the dairy cattle and young stock, and they quickly grew accustomed to eating it'. Once returned between the willow hedges at the farm, the pulp 'was unloaded into an earth pit that had been dug one foot into the ground and soon after covered with soil; it could be kept as feed for spring' (NEU 14.726: 29). They loaded the rail wagon with sugar beet.

Later, farmers would buy specially designed railroad wagons through the sugar factory (NEU 21,681: 24). They were placed on light-weight tracks that could easily be laid temporarily from the station to the beet field. Horses drew the wagon from the mountain of sugar beet taken from the field to the pressing station or railroad station, bringing the beet waste back to fertilise the land and feed the animals.

Cultivation systems

In Danish, the term used to describe the field plan in Table 4 was *vekselbrug* (*växelbruk* in Swedish), meaning that the cultivation (*brug* literally means 'use') alternated or changed. Specifically, it implied that all fields were in constant cultivation, although the crops circulated between them. Much of this terminology was shared between the scientists and the peasants, yet I doubt that many scientists can name more than a few of the more 75 types of soil which existed in the vocabulary of one Swedish peasant in 1875 (Löfgren 1979: 11).

When a field lay fallow, it was time to prepare it for the next six-year cycle. In the old days before drains were dug into the ground, one central climatic problem that all plough agriculturalists north of the Alps had to deal with was the abundance of water in the landscape. Throughout the Second Millennium, these heavy and clayey soils had been showered regularly by the weather systems arriving from the Atlantic. On the ground level, the abundant rainfall required some system to carry away the excess water from the arable land, otherwise the crop would rot away. For this purpose, trenches were dug between each field and even down each of them. This was done on the year when each field lay fallow, and so the trenches were called 'fallow trenches' (NEU 14,726: 12). With the horse, the men would proceed in this way:

> Before ploughing began on the fields, a furrow was ploughed on the inside as a guideline for the acre. The first furrow in the field is called furrowing up (*at fure op*); if it is a young man who is to plough, the master furrows up some fields for him, this must be done very carefully to maintain the width of the field and to loosen the soil in the old furrow to loosen the soil in the old furrow, it must first be thrown to both sides before it is ploughed together again; as a rule the old furrow is so clear, that it one ploughs it up again (NEU 14,726: 13).

There was, of course, great local variation in the prevailing modes of operation on the plains of Southern Scandinavia (Campbell 1936). But in most cases, it seems that those areas in which grain cultivation and a diverse breeding of animals (horses, cows, pigs, chickens, geese and so on) dominated, some variation of the Holstein system replaced the earlier three-course rotation system (fallow, barley, rye) from the times before enclosure and privatisation of the land. Among the main elements were a fallow diminished from a third to around a seventh, the introduction of clover and other nitrogen-fixating crops which also had some

nutritional value, and the parcelling out of the land into smaller fields, usually between 6 and 10.

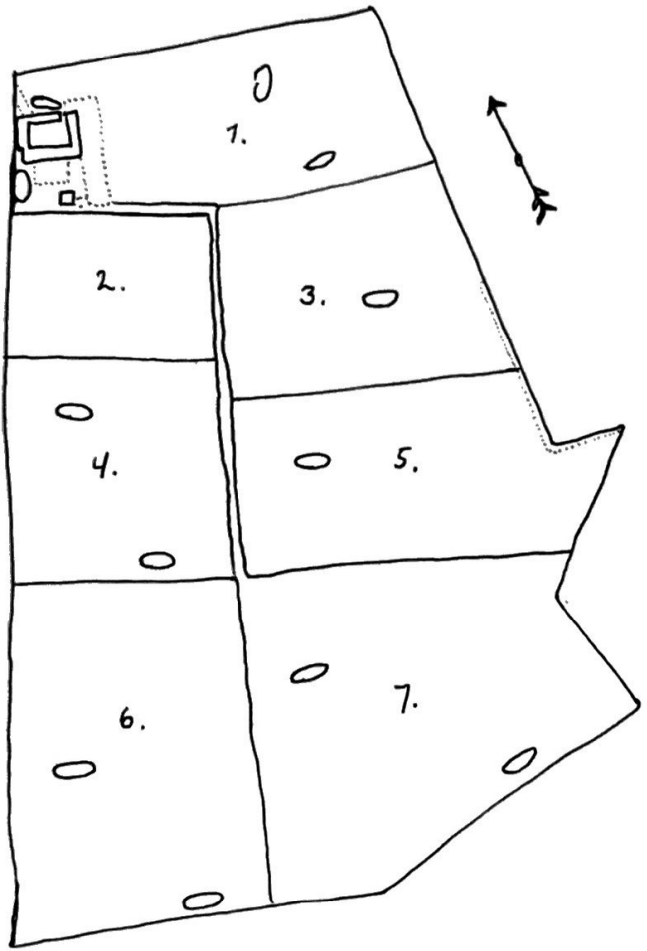

Figure 12. Crop rotation between the arrival of sugar beet with fallow trenches and willow hedges on Jens Madsen's 29-hectare childhood farm. The individual fields are named as follows: 1. Forest field, 2. Little field, 3. Middle field, 4. Stone field, 5. High field, 6. Rider's field and 7. Long field. Redrawn by the author after Jens Madsen's original (NEU 14,726: 31).

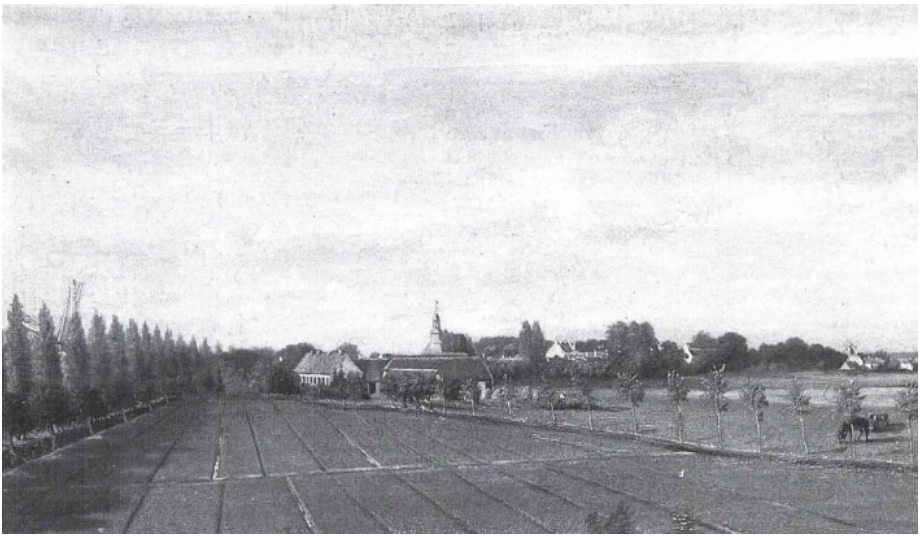

Figure 13. Before drainpipes were dug into the landscape, a network of fallow trenches led excess water away from the fields. This section of artisan painter Schultz' *Prospect of Maribo* from 1866 shows the result of farm labour meant to maintain the landscape (reproduced from Thorsen 1988: 82).

One Swedish farmer who grew up on 85 barrels of land (46 hectares) reported to the ethnologists that the following field plan was standard in the 1880s—just before the arrival of the sugar beet.

> 1. Fallow, full or half fallow. They used to let the geese onto the fallow in summer, and then it was not a real fallow anymore.
> 2. Rye, which was the main crop, and a bit of wheat. The latter could be sown on one barrel of low-lying land for 'coffee bread' for household consumption. The rye was winter-sown.
> 3. Peas and vetch, which were the only nitrogen-fixating plants, and some potatoes, the latter just for household consumption; later, this shift came to be dominated by root vegetables.
> 4. Barley, in which clover was sown.
> 5-6. Two-year pasture with clover.
> 7. The pasture is ploughed, and oat is sown.
> It was said that one had an eight-course in the circulation (FAL 12,101: 9).

This was only a slight variation on how one farmer cultivated his fields on Lolland: wheat → barley → mixed barley and oat → clover → clover → fallow (Boyhus 1976: 36). When that farm was taxed again thirty years later, the arrival of sugar beet had changed things considerably. The same fields now housed 24 cattle instead of nine. Three swine had multiplied and become two sows and fifteen pigs.

All the new animals were fed either with concentrated feed like soy cakes or with the fruits of the intensified mode of operation that is recorded as wheat → barley → barley → oat → sugar beet → sugar beet → grass → fodder beets, potatoes, crops for stall feeding and fallow. 'The whole fallow had been given up', Else-Marie Boyhus (1976: 39) noted and added that 'The area of barley expanded and the sugar beets arrived'. Both were decidedly industrial products. The first supplied the expanding beer industry, the second, the sugar factories. 'The beets also gave cash when the expenses for artificial fertiliser and seeds had been deducted, and the beets gave fodder because the tops and the leftovers that returned when the sugar juice had been extracted, was fed up' (Boyhus 1976: 39).

Whereas barley's and the sugar beet's entry into the industrial realm was beyond the peasants' control, the products of the expanded animal husbandry went into the famous Nordic cooperative sector. The contrast between the movement of energy on a global level and the old local circulation of fuels and foods in a landscape mark perhaps the most fundamental ecological contradiction of the peasant form of life as it moved into the new world. The many functions of the willow tree exemplify this. In the variation of *kobbelbrug* in place in Lolland, the willow hedges functioned as demarcations of the private property of individual peasant estates, particularly after the Great Reforms around the year 1800, which dissolved the old system of cultivation (see conclusion for a theoretical discussion of these cultivation structures). As we have seen, these hedges also protected the crops in the fields from the creatures, while providing all the fuel necessary for the kitchen year-round.

According to the old ethnologists, this was a situation unique to Lolland. In Skåne where the willow was also widespread—particularly on the Southern plains—hedges were not built between the willows (Hobroh 1944: 71). There, they only marked property and provided fuel (1944: 56–7). For this reason, the planting of these trees was the object of many royal decrees through the ages (1944: 37). But in Skåne, other techniques were used to keep the cattle away from the food of humans, primarily earthworks and stone fences.[11] The planting of

[11] Another ethnologist writing on this topic, Mårten Sjöbeck (1925: 73), points out that by the 1920s, industrialism had already wiped out many of the older types of hedges and fences,

willow, however, first picked up by the turn of the 19th century when farmland had been privatised through the Great Reforms. It lasted throughout the century—but only on the plains of Skåne where there were neither forests nor rocks—until the creatures began being tethered on the pastures (1944: 54, 59). From around 1880, many farmers stopped planting willow as a part of their fencing practice. What was lost was the shelter from the 'constant, dehydrating winds of the plain' and the fuel provided by the willow trees. What was won was long strips of land that could now be cultivated, as the animals had been removed from the fields (1944: 59).

In Sweden, a father and his son directed the rise of sugar beet. The father, Justus Tranchell, had been appointed by his father-in-law to manage a sugar factory in Landskrona that had until that time processed cane sugar. For a hundred years, molasses had been shipped in from the colonies to sweeten the life of the higher classes first, and soon enough to supply the lower classes too (Torell 2015: 128). The problem was, as the sugar company complained, that nobody wanted to grow sugar beet for the factory. The King's bailiff in the area reported that the reason why cultivation of beets did not pick up in the area was that 'the commoners do not comprehend their cultivation and that the distance to the point of sale was too remote for most of them' (Olsson 2002: 30). Already in the years between 1849 and '54—when Hagemann was still a child—Justus Tranchell's stock company solved this problem by buying a nearby manorial estate to cultivate sugar beet for the factory. In this way, the earliest attempts did bring together agriculture and factory under one authority.

In 1875, when the factory burned to the ground, the son Carl Tranchell had taken over the management. He used the occasion to rebuild the industry not in the image of a one-factory-one-estate model, but something larger. Following Hagemann's example, he planned to reconstruct the plant as a central factory which would stretch its infrastructural arms far into the landscape through a similar system of pipelines, pressing stations, and beet rails.

Located a few kilometres north of the town Landskrona, this small manor had around 350 hectares of arable land, a third of which was cultivated with beets as early as 1854. At that time, feudal arrangements were still in place to secure the labour for the operation of what one historian considered one of the earliest and greatest examples of 'the agro-industrial complex' in Sweden and Scandinavia as such (Olsson 2002: 10). Yet at Säbyholm, dairy production remained equally

including those that were woven. Somewhat contrary to Hobroh, Sjöbeck (1925: 81–6) argued that even on the largely woodless plains of Skåne, a variety of woven hedges, like those of the Lolland-type, existed.

important as the cultivation of sugar beets. These two branches appear to be reflected in two different systems of labour. The agricultural activities that were either year-round or traditional—milking and grain harvest—were carried out by a class of people with long-standing connections to the manor. In the early decades, these relations were feudal in nature, but later these arrangements were replaced by a more modern or contractual set in which the agricultural workers entered irrevocable one-year contracts in which they exchanged their labour for goods and a little cash.

At Säbyholm, barracks were erected to house the contract workers (*statare*) who always comprised an entire family. Marriage was usually a condition of entering into this form of labour arrangement. The contract labourer 'was not much better off than the slaves of the past', one of them, Sven Andersson (1985: 20), remembered in 1938, 'the only difference was that the contract worker could move when one year's service was done and serve at another master'.

As a young girl born out of wedlock by a teenage mother, Margit Rickard was only two years when she moved in with her maternal grandparents who were contract workers at the estate. 'There were 36 working families at the time', she (2002: 86) remembered later. 'Us children had to start working at a young age, help out with whatever we could'. This meant, primarily, weeding out in the beet fields after school. 'My grandmother (*mormor*) was in the front and hoed the rows of beets and weeds, and I crawled after in the long rows to thin out everything but the largest plant' (Rickard 2002: 86).

'It was tough work'.

They worked in large groups of children aged 10 to 12. 'The foreman walked with a stick in his hand twenty-five metres behind us, controlling that the work was properly done. We were not allowed to talk to each other for that would slow us down'. They were paid one krone a day, but had to hand them in to their parents, or in this case, grandparents, at home. 'It was the same for all of us so there was not much to think about' (Rickard 2022: 87). The people working in the beet field, on the contrary, were day labourers or seasonal, and often migrant, workers. To cultivate more than a hundred hectares of land with sugar beets, as was the case on Säbyholm from the 1850s onwards, was demanding labour at an unparalleled level. The problem was twofold. First, the beet seed was a multi-germinating one. Left to its own growth, it would produce several roots and stems resulting in uneven stands and sizes of the crop. Because this was a problem for the industrial processing of the beet, individual plants had to be manually thinned out so that only one would survive.

Secondly, contrary to grains which quickly grow high, casting a shadow to suffocate any competitors, the beet is a low-growth crop. Between the rows of beets, a field for weeds opens, and before long, the beet finds itself struggling for survival against these intruders rather than producing sugar. Most beet fields in the 19th century therefore required at least three rounds of thinning out between the beet plants each season. This extremely strenuous work was considered—from the very outset—women's work. Children, too, would engage in it, but there was a strong sense that it was degrading for men to engage in the beet work. Poor families in the area would send their women and children to thin out in the endless rows of beet, but the bulk of the labour force was drawn from other regions, particularly the wooded region of Småland. Each spring, first hundreds and soon enough thousands of young women would make their way down to the plains of Scania and work in the beet fields until harvest in October or November, when they manually dug out the beets from the heavy, clayey soil. This theme of 'foreign' and gendered labour proved to be an element which followed the history of the beet closely.

Many scholars of these episodes of agrarian fossilisation have pointed out that when new energy sources and machinery arrived around the turn of the 20th century, they did not immediately save labour (Flygare 1999: 215; Kuuse 1970). Quite the contrary, in the time of coal, machinery like steam threshers and ploughs required much more labour, not only to operate them but also due to the intensification of the landscape, to which the sugar beet is our current witness.

Agrarian historians typically consider steam ploughing to be a marginal phenomenon (Moberg 1989: 123; Blom 1986: 3). From a national point of view, this was no doubt true. Still, looking at the history of sugar beet cultivation, the steam plough played a central role—at least on the large estates which, as we have seen, devoted most of their land to the beet.

'It is a tremendous job', one contemporary observer wrote, 'these ploughs do in soils which are probably the stiffest in Sweden' (quoted in Thunström 2017: 41). To work, the steam plough needed large and relatively flat surfaces without many rocks. Where these conditions prevailed, like the plains of Skåne and Lolland, five men operated or supported the machinery. Two men fed it coal. One drove it. The two remaining men rode back and forth on horse, securing a steady flow of water and coal for the machines. Together, they ploughed five or even ten hectares per day. 'To achieve the same result by horse ploughing', the historian Per Thunström wrote, 'would have taken about sixty horses and some twenty men' (2017: 41).

Beet critique

Already in its early days, critics of the sleepless landscape were not hard to come by. In Sweden, the national poet August Strindberg saw the new landscape with his usual pessimism. 'No longer fields of waving barley', he wrote, 'a disturbing copper green is now laid over the old provincial yellow' (Quoted in Kuuse 1983: 35). He was talking about 'A factory landscape where the scent of clover is powerless against the stink of hydrogen sulphide and ammonium sulphide from the drainage ditches of the sugar factory'. A century before the eutrophication problems became commonly recognised, the sceptic poet smelled trouble. 'The Skåne of days gone by will soon be no more, but this ugly beet has saved Scanian farming and further enriched the country'. 'We may live off the fat of the land, but that fat has no beauty' (1983: 35).

Against these concerns—which, at the end of the day, sprung from the landscape aesthetics of the bourgeoisie—there were others more directly connected with the old class conflicts which escalated with the arrival of beet. Particularly, the arrival of migrant workers who had neither kinship links nor political affiliation around the beet fields constituted a problem for the labour unions across Europe. 'We social democratic vandals', Karl Kautsky, whose *The Agricultural Question* (1899) centred on the labour issues of the sugar industry, wrote, 'have no appreciation for the culture of beets through the unculture of humans' (Quoted in Zimmerman 2010: 99).

If it was penal systems in the style of Foucault's famous panopticon which created modern self-surveillance, enforcing the internalisation of an external gaze on the subjects, then, perhaps, it would not be too much to say that it was the entire infrastructural complex of railroads, pipelines, pressing stations, ports, even reaching kitchens and culinary customs, fully fuelled by coal which created a land without fallow. Should we follow the analogy further, the central factory, so conspicuous when it arrived and so invisible today, would be a kind of 'ahypnicon', colonising the sleep of the earth. In place of prison guards, its morality is enforced by consultants roaming a very liberal landscape, teaching a gospel of exchangeability. Some fertilisers, some seeds, some migrant workers will, they said, turn some profits from a land that had until then just been lying in idle provocation.

Farming in which sugar beets had taken the place of fallow, then, was not an isolated case. It expanded across Europe and the world. Consultants pushed the frontier of exchange further and further into the hinterland. People like Hagemann and his consultants turned to other crops that they thought might be cultivated industrially.

Figure 14. A politician, Christian Sonne, who would eventually become minister of agriculture in Denmark a few years later said, in 1915, that 'men can hardly reconcile' themselves 'with the crooked position that is required for a good result. They consider themselves disqualified to do so since, they argue, as I have often heard it', they seem 'to lack the extra hinge that women are presumed to possess' (Boyhus 1973: 121–2). Except for the poorest of the poor, thinning and weeding the beets remained a job of women and girls for generations to come. The drawing comes from Frederiksen's (1892: 195) major work on how to grow sugar beet.

But already at the time, natural scientists began to reflect on the implications of this fossil revolution: Fossil ploughing allowed agriculturalists to disregard the creatures' need for rest. By fossil means (railroads and steamships), beet cultivators sourced labour power from people who had no kinship roots and no claims to the landscape. By sourcing it externally, the extra labour needed for steam ships and coal was, therefore, devaluated, as the bargaining power of young women

migrating seasonally from Catholic Galicia to Protestant Scandinavia was poor at best.

'The German peasants have the idea that they hoe sugar into the beets', an American geographer later wrote, 'and this is not far from the truth, since on the same quality soil the sugar content varies from 10 to 18 per cent depending on the method of cultivation' (Quoted in Zimmerman 2010: 83). Contemporary agronomists expressed Hagemannian excitement for its morality. One of them said that 'sugarbeet farming stimulates the intelligence of the farmer', substituting 'rules handed down from antiquity' with 'rational, contemporary, farm management' (Quoted in Zimmerman 2010: 83).

According to the historian Angela Zimmerman 'The labor-intensive cultivation and harvesting of sugarbeets was carried out in large part by Polish migrants, who, like African American cotton growers, were regarded as ideally suited for such arduous and poorly paid labor because of their supposed racial inferiority' (2010: 83).

With 341 beet factories, Germany was the largest producer in Europe in 1914, followed by Russia (294), France (209), Austria-Hungary (201), Belgium (68), Italy (39), Spain (32), Holland (27), and finally, Sweden with 21 and Denmark with nine factories. The historian Lars Olsson (1996) argued that international struggles over the control of migrant labour, of which beet workers played a crucial role in European politics, resulted in the outbreak of the First World War. Already in 1912, the economic historian Imre Ferenczi warned that 'Within the next few years a heated competition and contest over human labor will break out among Europe's agricultural states. . . The population question will come to overwhelm all other issues' (Quoted in Olsson 1996: 895).

He was not wrong.

Even before the first thoroughly fossilised war broke out, political questions followed in the wake of the beet. 'The unravelling of events and conflicts which culminated in a cataclysmic war', Lars Olsson theorised, 'were heavily anchored in the struggle for a labour force which was both necessary and profitable for the agrarian and industrial capital' (1996: 897–8).

What characterised this labour force was, in the eyes of capital and states, its unprecedented mobility. By shipping workers around Europe, fossil fuels came to be the invisible foundations of the political economy. 'Industrialised warfare', too, as Timothy Mitchell points out, 'confirmed the importance of petroleum as a fuel for transportation rather than illumination' in a world where the 'expanding apparatus of war required coal and oil, steel and nitrate-based explosive, but also food, fodder and clothing' (2013: 66).

The development of large-scale production of artificial fertiliser took place within this agro-industrial-military complex in Germany. Through the Haber-Bosch process, German engineering had succeeded in capturing nitrogen out of thin air. Itself a highly fossil product, artificial fertiliser was now made by melting air at high temperatures under high pressure (Huber 2022: 91; Smil 2001). When the war did break out, the German War Ministry enrolled the nitrate production facilities in their war machine. The plants which produced artificial fertilisers with fossil energy could, without too much trouble, be converted into ammunition (Smil 2001: 104).

Slowly, such fossil-fuelled forms of fertility, marked by the inter-imperial rivalries, replaced earlier forms of fertilisers, coming from Chile, Britain, or Peru (Cushman 2014). While all life on earth, past and present, is based on carbon, it cannot work without nitrogen. All amino acids contain nitrogen, and they are the building blocks of protein. Animals get their proteins from plants (or from other animals that get them from plants). Nitrogen is by no means scarce, given that 79 per cent of the atmosphere consists of N_2. But there are only three ways in which nitrogen has historically been made available for plants.

First, and overwhelmingly, microorganisms in the soil fixate it and make it available to the plants that absorb it through their root systems. Throughout the history of agriculture, the whole point of laying land fallow was to allow this process to unfold. After one year or thirty, depending on the system of cultivation, a plot of land would be ready to give another harvest after the bacteria had done their silent work.

Secondly, lightning may help fixate nitrogen in the soil.

The result of these two factors has been that nitrogen has been a scarce resource for all farming cultures until the advent of artificial fertiliser, which represents the third way. As the writer Eskil Halberg (2020: 53) puts it, drawing on Malm's conceptualisation of fossil fuels as *stock energy*, artificial fertiliser is fertility which can be stored.

The longue durée of the fallow

When agriculturalists turned to fossil energy, the sun no longer provided all the immediate energy, captured by photosynthesis in the crops that were eaten by humans or animals, the latter in turn being held as stores of food, raw materials, or draft power. Now, agricultural life began latching on to energy sources buried deep underground with no relation to other species. Cultivation became extractivism, as it came to be tied to an influx of land and labour from somewhere else. Was the significance of the fossil revolution not on a par with the Neolithic

revolution thousands of years earlier? The metabolic rift consisted not only, as Eco-Marxists have pointed out, of the transfer of energy from the countryside to the cities without returning, but also of the movement of energy from the earth's interior to the agricultural soils in the form of transformed coal, gas, and oil (Saito 2022: 30; Foster 1999). The cultivation of sugar beet is as good as any marker of the depth of the changes in the land.

In the landscapes shaped by the plough, barley, rye, and wheat were the staples of civilisation in Southern Scandinavia, supplied with meat, milk and butter from cows, pigs, sheep, and hens locally, and increasingly also colonial products from the plantations to the East and West: sugar from cane, coffee and tea entered the diet and cotton covered the bodies. Photosynthesis fuelled the societies of the Holocene from hunters to the people of the plough, from matriliny to the nuclear family, and from animists to Enlightenment savants. Throughout this geological epoch, all agricultural systems had an ecological boundary which was recognised culturally in those sections of the arable land that lay fallow (Boserup 1965). 'To take another crop', appears to be the motto of all neolithic forms of life on these plains as elsewhere, 'we must let the land rest sufficiently'.

The conflicts over land and labour, over fertility and time, capital and sovereignty, brought an end to the Holocene. As Mitchell put it, 'A much smaller part of the population now handled the production and distribution of energy, and they handled it in huge quantities' (2013: 19). Fossil relations came to replace the older socio-ecological arrangements that were essentially renewable. In this light, the ethnographic evidence of the kinds that fill the folklife archives of Scandinavia read as a snapshot of agricultural life as it was transformed under the tragic inevitability with which fossilisation emerged in the age of coal. Soon, most people became urban and fewer spent their days handling energy. The peasants, on their part, began to handle greater amounts of it in their daily life.

Fallow was a basic fact of agricultural life throughout the Holocene.

Agriculture without it marked the end of that period and the beginning of the one which would come to replace it.

Geologists called it the Anthropocene.

Marxists called it the Capitalocene.

Postcolonialists called it the Plantationocene.

From the perspective of the plains, it was the birth of a sleepless land.

3 *Fossilising the plantation*

We have seen how the arrival of a set of new elements like migrant labour, artificial fertilisers, steam ploughs, pipelines and sugar factories, all of them made possible by burning fossil energy, created new relations between farmers and industry on the Scandinavian plains. But while these social relations were new in this corner of the world, they were not entirely new. Before sugar beet was cultivated, there was sugar cane. For a couple of centuries when agricultural land in Scandinavia lay ignorant of what a factory demands of it, the plains of the West Indian islands had been organised to run according to the rhythm of the factory.

Before implementing the central factory system on the Scandinavian plains (Chapter 2), Gustav Adolph Hagemann had already transformed the landscape of Denmark's most valuable colonial asset at the time, the sugar island St. Croix in the Caribbean Sea. Here we will follow him on his colonial journey to attempt to estimate how much of the plantation he ended up introducing to the metropolitan plains when the sleepless land was born. But it is not just the case that fossilisation continued the plantation using other means (this is also true), it also seems that rather than being far behind in the development of fossil modernity, the colonies were at the forefront of it. An empirical and conceptual thread runs back and forth between the sugar plantation in the colonies and the sleepless fields on the metropolitan plains. To acknowledge the connection, however, we must not be limited to one geography but instead follow the movement of people, goods, and ideas from one part the new world to the old one and back again.

In this vein, the postcolonial philosopher Susan Buck-Morss has argued that the plantation was the birthplace of the modern industrial logic.[12] Deriving from the Portuguese *feitoria*, originally meaning a colonial trading post, it would perhaps be more accurate to depict the factory as something which invaded Europe from the colonies rather than something that arose from Medieval-style artisan guilds in Europe (Buck-Morss 2009: 101). Likewise, by combining

[12] By making this argument, Buck-Morss follows the course charted by earlier anticolonial thinkers, most notably Eric Williams (1944), who would go on to become the first prime minister of Trinidad and Tobago after decolonisation (for another recent contribution, see also Graeber [2006] and Hornborg [2021]). Others, of course, have claimed that capitalism grew out of local European conditions. Examples of the latter are found, first, in the so-called 'Dobb-Sweeney debate' and later in the 'Brenner debate'.

'agriculture and processing under one authority', the plantation was, according to the Anthropologist Sidney Mintz, the model for subsequent agro-industrial systems:

> *discipline* was probably its first essential feature. This was because neither mill nor field could be separately (independently) productive. Second was the organization of the labor force itself, part skilled, part unskilled, and organized in terms of the plantation's overall productive goals. To the extent possible, the labor force was composed of interchangeable units—much of the labor was homogenous, in the eyes of the producers—characteristic of a lengthy middle period much later in the history of capitalism. Third, the system was time-conscious. This time-consciousness was dictated by the nature of the sugar cane and its processing requirements, but it permeated all phases of plantation life and accorded well with the emphasis on time that was later to become a central feature of capitalist industry (1985: 51. Emphasis in original).

Added to this unity of field and factory, the skilled and unskilled labour and tight timekeeping as a mode of authority were two other central traits which connected the plantation to the factory in world-historical terms: 'the separation of production from consumption' (produced in the New World, eaten in the Old World), 'and the separation of the worker from his tools' (Mintz 1985: 52).

During the 1870s, Hagemann travelled three times to St. Croix as a government-appointed envoy to salvage the colonial sugar production. A few years earlier, the colonies had contributed massively to the State's budget, but now things were looking gloomy in the colonies. Slavery had been abolished, the earth exhausted, and cane sugar was increasingly in competition with beet sugar. His plan was to establish a central factory in the middle of the island. Through pipelines, this would be connected to as many plantations as possible across the island, preferably all, harvesting the benefits of scale. However, the immediate result was not only technological progress, but also the largest labour riot in Scandinavian history.

The plan

Just before the uprising, Hagemann published a small pamphlet about the Danish sugar colony in the Caribbean, paving the way for the great transformation of the landscapes. 'It is not so many years ago', he wrote in his publication (which had the subtitle, *A Confidential Report*), 'that the Danish Island St. Croix by us at

home as well as by strangers was rightly considered a true Eldorado, while now only complaints sound from there' (1875: 4).

There were 80 independent sugar plantations on St. Croix, but, as Hagemann noted in 1875, they were owned by 53 people. In the years around 1818, these plantations produced as much as 7 per cent of the world's sugar (Tomich 1990: 53). Many of these plantation owners, however, lived in England, many of them former managers worked their way up the plantation system, and retired to Europe once they become owners. Many of these, Hagemann remarked bitterly, 'went to West India to try their luck, and have in some sense found it in much larger degree than their abilities justify' (1875: 5). These would-be managers that often came from Ireland, Scotland, Germany or Denmark, although lacking in understanding of agriculture, faced no difficulties in acquiring positions as 'under-managers' (*Underforvaltere*). Then they would quickly learn 'the system' and if they succeeded in managing the workers, they would rise to the too well-paid position of manager (*Forvalter*). Although it had been nearly 30 years since Emancipation when slavery was abolished in 1848, 'one is surprised to find the laws that regulate the relations between workers and employers only stand a few degrees above a real slavery'. To understand St. Croix, he went on, one must look at the people involved in sugar production; 'only then can we comprehend how the prevailing condition is possible in our advanced time' (Hagemann 1875: 5).

In any Caribbean Island under colonialism, the natural topography played an extraordinary role in social life. Volcanic in origin, large parts of their surfaces were steep mountainsides which were difficult not only to cultivate, but also to move around in. These highlands had always been considered wilderness by colonists. Not only is it impossible to convert these strips of land into exchange value, but they also form an impenetrable refuge for those who wish to escape the colonial relations (Ferdinand 2022). From this perspective, one could begin to consider the highlands not as 'wilderness' in objective terms but only subjectively in a colonial discourse, and as a cultural landscape—one that is shaped by the subsistence activities which support the ongoing struggle or resistance against colonial subjugation to the logic of exchange. From those occupying the 'wilderness', as well as for those who intend to study it without reproducing the imperial organisation of the world, the relations between Maroons and the crops they cultivated and the animals they lived with are a clear testimony to the embodied experience of the highland as a cultural landscape (Ferdinand 2022: 191). This is something conceptually very different from an empty and 'natural' 'wilderness' waiting to be rendered 'useful' or orderly. It was, for example, the

highlands of Haiti that allowed the rebels to overthrow the Napoleonic army during the Haitian Revolution (James 1938: 299–319).

The plantations, on their part, are located on the fertile flatlands below the ridges where the land can easily be divided into uniform plots, and where transportation of people and products from the land to the shipping port is facilitated, where panoptic oversight may be installed more comfortably (Bernstein 2010: 66). Here, the memory of the genocides that emptied the land fades away. It was these flatlands that 'the humans have made the object of culture, for the cultivation of sugar cane', Hagemann wrote:

> Sugar cane is a mighty species of grass that—like almost any type of grass that does not produce seeds—is a relatively frugal plant. Nevertheless, by the continuous one-sided cultivation, even the fertile Eastern part of the island has been robbed of its original fecundity that the sugar cane there grows far less plentily than in more virgin soil. The agriculture is operated such that a planter divides his land into two parts. The best part he brings into sugar land, the other part for grassland. From the grassland he collects the grass that he needs to support his creatures, and the manure from these is then taken to the sugar land. Thus, he takes the soil wealth out of the grassland to bring it to the sugar land. But as for what concerns the sugar land itself, he steals from it every year the entire crop that it brings forth (1885: 2–3).

By the 1870s, West Indian sugar production was still organised in the way designed under slavery. Each plantation had its own sugar mill, uniting the field with the factory on a small scale. St. Croix, for example, had 88 sugar factories in 1876. Hagemann ascribed all kinds of colonial miseries to this system. 'That the prevailing distress originates from the fact that the entire sugar industry, and therefore also agriculture, everywhere sits at an outdated stage, there can be no doubt', he (1876: 1) wrote in another pamphlet with the title *About the construction of a central sugar factory in St. Croix*. These plants were, naturally, too small to keep up with the 'development'. Great profits were lost in this system, which, in turn, led to the neglect of all the cane fields. Now, however, 'one has eyed the fundamental change of the entire operation that is necessary if the Island is to avoid ruin'. The plan involved 'replacing the old works with central factories, which are cheaper to build, work, and works the cane more efficiently to a better result' (1876: 1). It would finally separate agriculture from industry in the colonies.

Hagemann's plan was to create one central factory to process all the island's cane. He was going to build not only the factory but also a system of railroads and pipelines across the island to transport the cane from field to boilery quickly, before they turned bad under the relentless tropical sun. He soon got the approval of the colony's governor, August Garde. In a postscript to the pamphlet, the governor noted that Hagemann had spent four months in St. Croix to investigate the matters thoroughly. He ended the little publication with the following words.

> Although I am in no way competent to express any opinion about the result which he (Hagemann) has produced above, I have, by following his research step for step, and by seeking out as precise knowledge on the question, which generally has been under serious and general contemplation on the Island in later years, as possible, been convinced about the reliability of his understanding of the matters.
>
> Copenhagen, March 1, 1876
> Aug. Garde
> Governor of the Danish West Indian Islands (Hagemann 1876: 3).

The year before, Hagemann sent a letter to all the planters of the island in which he explained the plan to establish pressing stations at 13 different locations around the island, making the distances the cane needed to travel manageable. The proposed locations of the stations were around La Grande Princesse, between Concordia and Glyn, About Grange Gut, Barren Spot, between Fredensborg and Bethlehem, about Fair Plain, between Upper Love and River, Enfield Green and Diamond, around Whim, between Montpellier and Orange Grove, about Mt. Victory and at La Grange 'which last being connected with a light tramway along the seashore will be able to take all the Western estates' (Hagemann 1875a: 1). In the letter, he describes how it will be inevitable that the times of harvest will have to be determined by the factory, but he also writes that there will be loans available for those plantations whose economies will struggle to make the transition.

'Steam ploughs will be bought by the company, and ploughing will be done in advance of the crops, if required, at a low price', Hagemann assured the planters, 'as, of course, it cannot be an object to gain more than a fair interest from the capital thus invested' (1875a: 2). Further, imported fertilisers 'will be advanced to those who wish to use them, and under the guarantee of the company, the bagasse will be sold to the planters in proportion to the quantity of canes delivered', at a price of 15 cents for a cartload the first year.

In his *Confidential Report*, Hagemann (1875) noted that complaints came from all sides, and they were well-grounded. In the 1870s, therefore, 'the island, if no expedient change of system averts the threatening danger, in one, two or three years, will be an abandoned and uncultivated colony', Hagemann (1875: 4) warned.

> The most significant attempt at improvement which, however, due to unfortunate dispositions, has not been of any use, has been the introduction of the first steam plough. With the steam plough came the need for proper soil treatment and the good results did not fail to materialise. Where it was used, it was generally recognised as an excellent tool, but that was about the extent to which it was recognised. Although it belonged, or perhaps precisely because it belonged, to the most industrious and skilful planters on the island, the people who accompanied the plough were soon dismissed because they were too expensive, and their places were filled with Blacks, while the owners demanded that the capital invested in the plough should immediately yield a large return, i.e., they demanded an unreasonably high rent for the implement (1875: 4).

As a result, instead of ploughing deeper and deeper into the Caribbean soil, the newly acquired steam plough ended up scarcely being used. The higher yields it brought did not justify the price, which was too high. On top of that, a few years of bad weather 'forced the owners to increase the already very high rent'. The steam plough, in short, was not used as it should be, Hagemann concluded.

> Now the steam plough stands out in the open air on the Lower Love and is probably only worth half of what it was bought for four years ago, but even today the larger harvest yields show where it has worked (1875: 14–5).

The steam plough was 'an excellent tool' because it allowed a deeper ploughing of the soil than a plough drawn by oxen and a much deeper one than was possible by the plantation workers turning the soil manually using a how. The fossil plough released energy hitherto locked away deeper in the soil. Through modern technology, and only this way, could the miseries of the old system be overcome. Before returning to the large technological schemes that Hagemann and like-minded individuals conceived of, let us take a quick look at his diagnosis of the landscape he encountered in the Danish West Indies, particularly on the most important sugar island of St. Croix.

Before fossilisation, the operation of a sugar plantation rested on two different kinds of productive lands: the sugar land that creates the commodity which really interests Hagemann, as it does for any other colonist, on the one hand, and the grassland which was long necessary for reproduction of the ecology of sugar, on the other. When Hagemann arrived in the 1870s, however, this former 'Eldorado' divided into sugar land and grass land was experiencing deep economic and social problems. Emancipation, bad weather, poor management, and general predation, it seemed to the white elites, seriously challenged what they—unironically—called the 'good old system'. From the perspective of those working the land, it is hard to see what about this old system could be considered good. It was a landscape inhabited by people stolen from another continent, ripped out of their social context, and installed in the endless rows of sugar cane where they were forced to work from 4 in the morning to 6 in the evening without any compensation other than the lashes from the whip (James 1938). Later, after Emancipation, most people appear to have considered the abolition of slavery only a legal nicety, as new and very strict vagrant laws forced Black workers to enter into a one-year-long, irrevocable contract which, in the words of Hagemann himself, only stood 'a few degrees above slavery proper' (1875: 4). The landscape itself had been exhausted after 150 years of deforestation, erosions, and the endless movement of energy from the land to the bellies of white people living overseas. A metabolic rift between inputs and outputs was the ecological condition of the plantation landscape. Hagemann the engineer, on his part, spilled very little ink thinking about the social conditions in the landscape and preferred to keep things more economic and technical. With a phrase that has a distinct 19th-century ring to it, he spoke of 'soil wealth' in his account of the 'Fall of Eldorado'. 'As long as the prices of sugar were generally high and the soil less exhausted than it currently is, it did not matter much if the managers misused their rights', he wrote, 'for the plantations had a high value and gave a beautiful yearly yield, but to the system was glued the main mistake that the manager, in order to conceal his dishonesty, forced the plantation operation and further exhausted the soil' (1875: 5). Hagemann continued his analysis of the good old system.

> now that the prices began to fall, and the soil gradually was destroyed, the reaction entered: The plantation could no longer bear the large and costly apparatus, the owner bankrupted, and the now disreputable plantation fell into the hands of the manager. Surely, it was immediately operated a bit better, but the new owner had become all too accustomed to the system of exploitation to sacrifice anything substantial on his property; he continued the operation of

> chance that he learned, what on the island was branded as 'the good old system'. If he was lucky with the rain, before long he would be able to disburse everything in his cheaply acquired plantation, and his ambition drove him as soon as he had gotten his estate for nothing, to buy even more land without considering that a form of operation that is almost entirely dependent on the weather, first and foremost requires a good cash balance if he was to face the future with any degree of peace (1875: 5).

Just two bad years of this system of 'predation' are enough to bankrupt the new owner, and then the cycle continues with another newcomer looking to take his chances. The kinds of managers that Hagemann encountered only had 'one good side: diligence and care', although he (1875: 5) found that these attributes were used in the wrong direction. Under other circumstances, he dreamed, they could be put to good use.

During the First World War, fearing that the Germans might conquer St. Croix, the United States ended up buying the island from Denmark, ending the Scandinavian country's relationship to sugar plantations. From then on, Danish sugar would be beet sugar.

A predatory mode of operation

In the 'good old system', the most important tool was not the plough, but the much more labour-intensive hoe. On the Danish West Indies, there was regular ploughing on most plantations—contrary to reports from Martinique which completely lacked ploughing—but in any case, this was only the first step before preparing the land to receive the cane.

Figure 15. The hoe was the primary tool in 'the good old system'. Redrawn by the author after Sveistrup (1942: 93).

The aim of ploughing the land was getting rid of weeds rather than any deep turning of the soil, as is the goal in the wet landscapes of Northern Europe (Hagemann 1885: 4). Under supervision of the overseer-manager, plantation workers lined up side-by-side like pawns on the first row of a chess board. Each armed with a hoe, they dug a small, rectangular depression in the ground. 20

centimetres deep and around 1 square metre in size, these depressions were, simply, called 'holes'. The soil that had been scraped out of the 'hole' was arranged along the edges of it, effectively creating a barrier between one landscape unit and its four neighbouring ones. Inside it, the workers planted two or three canes and put in some manure.

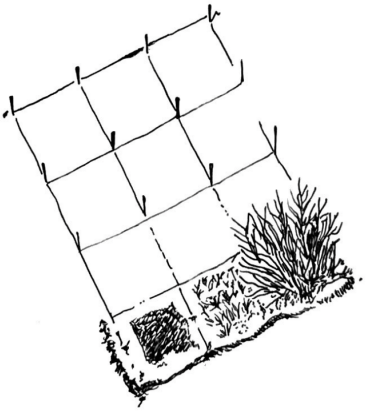

Figure 16. The pattern of 'deep culture'. A depression is dug in the middle of the square by placing the topsoil on the mound. Redrawn by the author after Sveistrup (1942: 93).

Thus, after completing one square, much like chess pawns, they stepped into the field in front of them and repeated the operation for 14 hours a day under the tropical sun. There were 100,000 squares in an average sugar plantation. Another name for this endless checkboard was 'deep culture' (*dybdekultur*) because cultivation occurred at the bottom of the 'holes'. For Hagemann, the 'good old system' was not only a form of gambling (*chancedrift*) but even predation. In it, one should find the reason for the 'threatening danger' which in only a few years would leave behind 'an abandoned and uncultivated colony' (1875: 10).

> If one asks the planters for the reason why the work is carried out in this way, one always gets an answer that stands out more by its self-confidence than by any prominent rationality. Some would answer that the bank will provide shade for the young plant; a theory which is most marvellous in the tropics, where one always steps on one's own shadow. Others would say that it was a way of collecting water for the young plant, and one often finds the trenches placed horizontally around the slopes; but the further one investigates the matter, the more doubtful one becomes (Hagemann 1875: 10).

Discarding all 'native' interpretations of the benefits of 'deep culture', Hagemann concluded that the true aim was nothing other than providing new surface soil by removing the topsoil. In this way, colonial agriculture assumes an extractivist character: To harvest, each year one must sow deeper in the ground.

If rain falls in just the right amounts, the underground will be able to absorb it and produce plentifully. But if it rains too hard, the hard underground cannot absorb it, and it flows away, taking with it the topsoil. On the other hand, if it rains too little, the cane will not grow, hence the interest in water in a plantation landscape that has lost its capacity to absorb rainwater. Criticising the flow of organic waste, the mismanagement of manure and compost, Hagemann concludes that, with such a system of cultivation,

> harvest after another is taken from the earth, and it is no wonder that it has gotten tired. Only in the fifth year, that is after the same root for four upon each other following years has had to give its cane-crop, and that in this period nothing has been done for the field other than that the leaves stripped from the sugar cane are left on the ground, the same treatment of the soil is carried out once again, and what has been done by the ancestors for more than 200 years is continued! However, one should not believe that the planters, despite their assurances of the contrary, have no understanding of the poor state of agriculture (1875: 13).

Instead of planting in the underground by scraping away the exhausted topsoil, steam ploughing, the reasoning goes, could be the key to averting ecological collapse and its related economic, social, and political consequences.

'With impunity', he wrote, 'no one can—year after year, crop after crop—take from the earth without giving it full compensation' (1885: 5). Resorting to steam, thus, held a promise to push the limits of scalability which derived from the relations between oxen, cane, hoe, soil, water and all the other landscape elements which made up the plantation.

It was an abstract landscape which imposed its rational logic without regard to local topography. The exhaustion of the soil which Hagemann responded to was, in a sense, a result of the plantation structure itself. As long as sugar islands like St. Croix were subjected to being producers of goods for another part of the world, a certain form of extractivism was written into the soil itself. Over the decades, embodied energy simply moved from the Caribbean to Scandinavia in an example of what the human ecologist Alf Hornborg called 'unequal exchange' (2021: 446–

8). Seen from this perspective, fossilisation only accelerates a pattern of appropriating time and space, land and labour, from some people to others. Once fossilised, the plantation is no longer only extracted but itself extracting other parts of the world in a web of coal, fertilisers, labour and commodities.

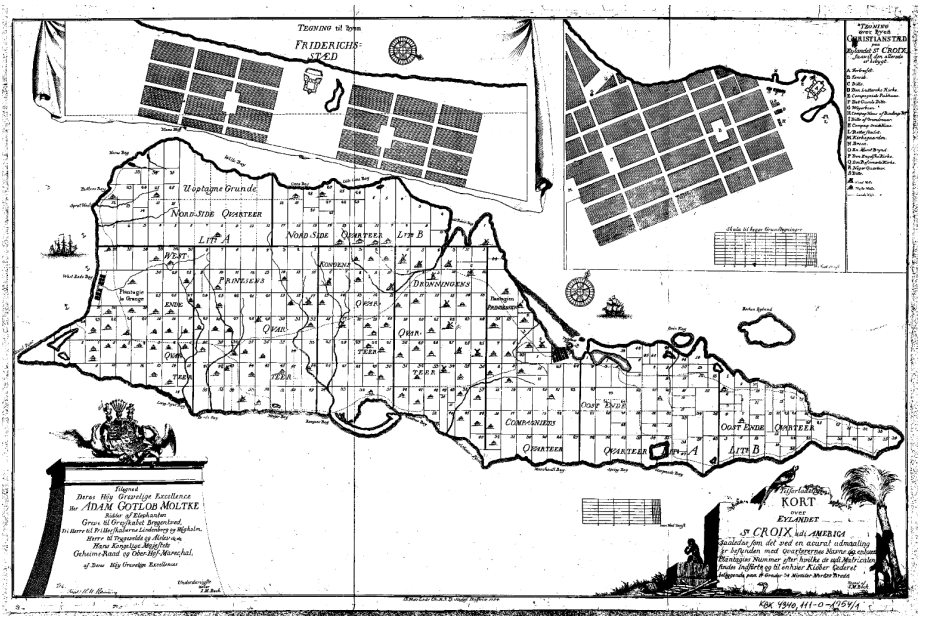

Figure 17. Cadastral map of St. Croix from 1754 projecting abstract space largely disregarding the natural topography which makes uniform and rectangular plots impossible in certain parts, like the Northwestern corner of the island. I. M. Beck's map with a title which translates as 'Reliable Map of the Eyland St Croix out in America' (Royal Danish Library).

'About the worker', Hagemann wrote in his 1875 publication, 'there is, in fact, nothing important to say' (1875: 6). The Black worker, he went on,

> is a child, usually frugal, easy to direct, seldom very diligent, but, on the other hand, when he must be, for example in during the harvest, enduring and willing. Surely, he has several less-desirable qualities but when one looks to the order of the conditions of work and the profits a Black may gain from getting something done, then one will find it reasonable that he is not better than he is (1875: 6).

On many plantations across the West Indies, steam engines did replace windmills shortly after the abolition of slavery. But, as Dale Tomich noted in his economic history of the sugar island Martinique, 'Steam power did not revolutionize sugar manufacture, but rather was adapted to the existing organization of production' (1990: 240). Instead, there was a wide-spread feeling that, despite Emancipation, the Blacks were not free and the landscape, in any case, remained largely unchanged.

Hagemann's method

For anyone who would like to write off the plantation as an exception to the modern world, the introduction of fossil fuels into cane fields spells trouble. Why is it that fossil fuels first arrived at the same time as slavery was abolished? Was slavery so backwards that it denied any modern rationality in production? Or was it rather the case that fossilisation was an extension of the logic of the plantation with new means? How are we to explain that, within the Scandinavian world, the sugar plantation of St. Croix was one of the first places to be fossilised? Did the colony stand at the forefront of modernity?

As we saw in the introduction to this chapter, it has been argued that the defining feature of the West Indian plantation system was that it systematically separated workers from their kin (Buck-Morss 2009; Graeber 2006; Mintz 1985; Tsing 2012). If anything, this process of abstracting workers only accelerated as the transport of goods and people shifted from sail ships to steamboats.

The system of pipelines, pressing stations and light railroads, coordinating the movement of sugar from the fields to the central factory which Hagemann implemented in Scandinavia, was first constructed in the colony of St. Croix. His problems with the 'good old system' were, as we saw in the last chapter, many. The creation of a new and fossilised system, then, was conceived of as solving many problems at once. In the fields, steam ploughs and commercial fertilisers were to mitigate the declining fertility of the soils. In the factory, the switch to coal allowed for a greater crystallisation of the sugar in the cane. And in terms of labour, steam allowed for the sourcing of a labour force that was not accustomed to the island's conditions.

But while conceived of as solving problems, the creation of a central factory in the old plantation landscape also gave rise to new issues. As it happened, the opening of Hagemann's central factory led to the largest labour revolt in Scandinavian history.

Hagemann did not come up with the idea of a central factory himself. He got it from a French engineer called Jules Linard who won a gold medal at the World

Fair in 1878 for a system which pumped the juice of the sugar beet from the pressing station out in the landscape into the central factory. Already during the 1860s, he oversaw the construction of around 150 of them across France. There, sugar beet had been cultivated since the beginning of the century when Napoleon was emperor and feared a popular uprising against him due to lack of sugar. The problem was that France had lost its most important colony when the plantation workers of St. Domingue revolted against the colonisers and created a Black state of their own, Haiti. This revolution, unthinkable as it was even when it took place, had cut off the supplies of sugar on which the French had steadily and increasingly become reliant during the 18th century (Trouillot 1995: 73–106).

For Napoleon, who could not win the war in the West Indies, his political life came to depend on securing another source of sugar at home (Magnuson 1918: 69–70). In 1806, when he also found himself under a blockade which denied the French access to the oceans because of his war with the British, things were looking dim. He threw all his hopes into the possibility that sugar beet might replace the colonial calories. Through decrees and subsidies, the first real sugar beet industry was built exactly when French colonialism was denied by the British who, in those years, were on the verge of establishing themselves as a global, although not yet fossil, empire: 'take the case of sugar and coffee', noted two observers who grew up with these events in living memory,

> which have proved their world-historical importance in the nineteenth century by the fact that the lack of these products, occasioned by the Napoleonic Continental System, caused the Germans to rise against Napoleon, and thus became the real basis of the glorious Wars of liberation of 1813. From this it follows that this transformation of history into world history is not indeed a mere abstract act on the part of the 'self-consciousness', the world spirit, or of any other metaphysical spectre, but a quite material, empirically verifiable act, an act the proof of which every individual furnishes as he comes and goes, eats, drinks and clothes himself (Marx and Engels 1988 [1844]: 58–9).

Napoleon abdicated in 1814, and the British lifted the blockade. From then on, the remaining French sugar-producing colonies in the Caribbean—Martinique and Guadeloupe—had to compete with the domestic beet sugar industry which had been both subsidised and exempted from import taxes (Tomich 1990: 404). Under this new, more competitive, regime, production in both places came under pressure to develop new ways of optimising production. New equipment for sugar refinement wandered from the factories of North France to Martinique. The idea

was that only with a large, centrally placed factory fully equipped with the most modern technology could the full benefits be harvested. In the French context, the system was called *usine centrale*, which became the hope for colonial survival during the 1830s and '40s.

Back in France, Jules Linard developed his pressing stations in the following decades, optimising the transport which until then had taken place either on horse-drawn carts or by boat. By building pressing and pumping stations (*râperies*) nearby out in the agricultural landscape, and by adding lime to the juice, a much greater scale could be achieved.

The Fireburn uprising

Having secured support from colonial officials as well as the Danish Government, the time had come to leave the 'good old system' behind. When the central factory opened in October 1878, the largest labour riot in Danish history broke out. The sources on which any scientific description of the events must be based carry all the problems which exist in a colony. It was the ruling classes, the people who had a vested interest in the plantation, who produced written accounts of what happened. Newspapers, governmental memos, and, later, court rulings were written by the white elite.

On the Black side, however, the events remain as the defining moment in the struggle for freedom—something which was promised but not delivered with the abolition of slavery in 1848. No other history is as well documented as Fireburn in the oral tradition in St. Croix. Still in the 2020s, many Crucians referred to Fireburn as the key point in their historical identity (Navarro 2021).

I approach this episode from a slightly different angle. I am in no way capable of defining what Fireburn meant to the identity of the Islanders, neither do I set out to write a full account of what Fireburn was.[13] I want to draw attention to a fact which tended to be universally overlooked in this most important event in Scandinavian colonial history: that it was the direct response to the first wave of fossilisation as it swept across these long-exploited tropical islands. To begin at the end, things did not end well for the rioters. More than four hundred were arrested and imprisoned on St. Croix. Some 40 were sent to Copenhagen where they all received death sentences.

The case took up 44 pages in the protocol of the supreme court rulings, outweighing by far the few pages needed to describe the case against a farmer accused of and convicted for theft and deceit (he had stolen his neighbour's grains

[13] For such an account, see the historian Rikke Lie Halberg's forthcoming dissertation from Lund University.

while they were still sitting on the field). The transcripts include a description of the events of October 1878, which went as follows.

> On Tuesday, the 1st of October 1878, in the early part of the day, as is usual on the 1st of October, the ordinary day of change, a crowd of agricultural labourers poured into the towns, and after midday a large number of Blacks were gathered in Frederikssted, especially in and around the rum stalls, which lie in the main streets. There are people who would have noticed that the Blacks were more boisterous and lively than usual, and boasted and bragged about the price they wanted for their 'passports'; moreover, as they travelled about town and the rum stalls, where they drank abundantly, they became more and more loud and merry, but there was nothing in their speech and conduct to indicate that they would go beyond ordinary spectacles, and it does not appear that there was any fear in the town that the public peace would be disturbed, when suddenly, at about three o'clock in the afternoon, an incident involving a drunken Black, whom the salesman in rum seller Junghans' stall threw out of the door because he had quarrelled with another Black, gave the impetus to the disturbance from which the later events developed. When two policemen came to take away the drunken Black, who was bleeding from a wound in the head—whether brought on by a blow or by falling—several Blacks interfered, and a resistance arose against the policemen, whom they tried to wrestle away and also wrestled away the Black, who was then taken away by a mob of comrades. When the police officers then attempted to arrest the Black who seemed to be leading the mob, this also failed, and when a little later the chief of police, in company with the police assistant and accompanied by two prepared soldiers, arrived, the mob had reached such a size and excitement that it was still not possible to establish order and calm, but the mob followed the chief of police and his men back towards the police chamber in the fort, shouting and screaming, partly even throwing stones at them (Høiesteretstidende 1881–82: 171–2).

The police managed to disperse the crowd. But the people gathered again and began to express their dissatisfaction with the labour conditions. The police had success in convincing the crowd to break up again and return home.

But then someone came along shouting that the Black man had died in police custody. 'There was then no longer any control over the mob', the account went on.

> The Blacks again rushed into the town, entered the hospital to see the Black, who was in perfect condition, but this did nothing to calm the crowd. It (the mob) again headed down towards the fort, where, however, the police force had for the most part enclosed themselves and armed, and when the Blacks endeavoured to enter the fort and attacked it with stones, shells, and small cannon balls, which they found stacked in the outer fort, they were fired upon, and several of them among them were wounded. The size of the mob that stormed against the fort was, there are such widely differing accounts of the size of the mob that stormed that no certain estimate can be formed; it may have numbered several hundred (Høiesteretstidende 1881–82: 172).

A plantation owner, Mr. Fontaine, was riding when he was hit on the head by a stone or a conch shell and then beaten off his horse with a stick. Shocked by its own actions, the mob retreated. He died the same night.

Guns were fired which scared the Blacks away from town square where they had gathered. Scattered around, drinking began. Some rooms, belonging to a customs officer and a police officer, were attacked and destroyed. The conch shell was blown. The townspeople (white presumably) no longer dared go into the street).

> No direction or leadership of the riot can be demonstrated with any certainty at this point, although the negro who was at the head of those who tore the drunken man from the police officers, Joe la Grange, who lost his life in the course of the riot, is still mentioned as a principal character, and it has not been possible to discover at what instigation or on what occasion the arson attacks began (Høiesteretstidende 1881–82: 173).

The arson began.

Tuesday evening, shops were looted and when more plantation workers joined in, the lower part of town was set on fire. Violence broke out, and the whole thing lasted until the morning on Wednesday October 2nd when soldiers arrived, and the crowd disappeared into the cane fields. Another attempt to set the upper part of town on fire failed.

'The next significant episode in the riot was the murderous assault which, Wednesday morning, was carried out on two soldiers who had been abandoned with the transport carts on the Carlton Plantation' (Høiesteretstidende 1881–82: 174). The mob gathered around them and beat them to death. Having left the two soldiers in a ditch, the crowd continued to the nearby Whim plantation and

set the bagasse heaps on fire and vandalised the Great House. They proceeded to the plantations Concordia and Wheel of Fortune where they burned the mills. Around midday, more people joined the crowd. Hundreds of Blacks went to another plantation, Mountain, and destroyed the residence. Later, the plantations St. George's and Grove Palace were burned. During the evening, they reached Upper Love, Jealousy and Mount Pleasant before Mon Bijou, Fredensborg and Slob was set on fire. The next day, perhaps with new rioters, the crowd continued, and more mills were burned. The supreme court protocol of the case dating May 23, 1881, ended with the words, 'The proceedings have been legal' (Høiesteretstidende 1881–82: 213)

Enough was enough was the sentiment among the Black plantation workers. 'For many fieldhands, the injustice had become unbearable', wrote the crucian historian George Tyson (1995: 146). In Crucian folklore, one of the forty rioters became an icon of particular importance. Already in the Supreme Court proceedings, the seeds of her fame were planted. About detainee no. 34, it said that,

> Mary Thomas of Sprathall Plantation, born in Antigua, arrived here 14 years ago, estimated to be 25 to 30 years old, has become known under the name 'Queen Mary' as one of the most fierce, persistent leaders of the gang that on the 3rd of October harboured on the West-End North side, as described above and especially by A. A. Francis Harrison and Emanuel Jacob. She has admitted in her confessions that, as soon as Thomas Graydon began to form his gang, she followed him, wearing a scarf fastened to a stick like a flag, and did not rest until the gang had burnt 'Punch' in the evening; Just as she has admitted that she was one of the leaders, and was called 'Queen,' though, in the face of the many statements to the effect that she was the most violent, so that in several places, when even Colonel Peter was inclined to scandal, she, with the cry 'burn level down', drove on the destruction, has wanted to believe that a poor woman like her could have no power over the men. She has been part of the fire night in Frederikssted, but against her denial it has not been proven that she has participated in looting or arson. She has previously only been punished for minor offences (Høiesteretstidende 1881–82, 208).

She was given a death sentence. But like all the other convicted rioters, their capital punishment was soon commuted by the King to various lengths of prison

time. In 1882, Thomas was transferred to a prison in St. Croix where she remained until she died five years later.[14]

Like so many other plantation workers of her generation, Mary Thomas had arrived in St. Croix from one of the other Caribbean Islands. With growing frustration that the promises of emancipations had yet to materialise among the native workers, plantation owners began to contract labour from neighbouring islands from the 1860s, particular from Barbados and Antigua, where it was thought that more discipline had been cultivated in the labour force.

No matter where they came from, they all worked the fields of the 'good old system' from early morning to late at night. Weeding, planting cane in the underground and carrying the harvest to the mill were the elements of the cycle of life. Without a contract, the Black workers would be sentenced to forced labour which was, if anything, tougher than the plantation work they were used to.

Even escaping the island during the one month in which they were allowed to move around looking for a new contract became increasingly difficult. What Hagemann's plan of a central factory did was to upset the old order. This was not because it was intended to replace the plantation system with a fundamentally different order that disorder ensued. Rather it was the needs of the central factory of control over time and space, the need for reliable labour to keep the landscape organism running, which caused the managers to offer two or three times the wage that could be had in the plantations.

Figure 18. Each circle marks a plantation been burnt during Fireburn. Map from the *New York Herald*, November 28 (1878).

[14] But she lived on in popular culture on the Island. 'Queen Mary, oh where you gon' go burn?', school children still sing across the island, according to Anthropologist Tami Navarro (2021: 52). 'Don't ask me nothin' at all. Just give me the match and oil!'.

A few months after the uprising had been repressed and the colonial order restored, Hagemann arrived again. 'It is indeed a sad sight to see all the burnt plantations', he wrote in a letter, 'but it does not really make as terrible an impression as one might think. Far worse, I think, is the fact that the great harvest, which had been looked forward to, falls far short of expectations' (Quoted in Vinding 1942: 141).

Although Hagemann on many occasions made it clear that the plantation model in his eyes was the only viable way of arranging the colonial landscape, he also complained about the brutality of the plantation owners. In a letter, he wrote that 'I have heard a great deal about the events of the rebellion out here, that the conduct and behaviour of (Governor) Garde, but especially of his officials, is not open to even mild criticism'. Hagemann continued.

> They had behaved like pure chieftains, and one cannot wonder that there is a general resentment here. But then, in return, the planters have shown such cruelty to the Blacks after the riot that it is enough to make you mad. The conditions here should be properly cleaned up—they are rotten! From Mrs Mac Evoy, I greet and thank you very much. I sent the pictures down immediately, and her husband came yesterday and paid a visit to say hello and thank you. That madman has been one of the cruellest planters; I know from his own mouth that he shot five Blacks when he came home to the plantation after the riot. All others live as before (Quoted in Vinding 1942: 141).

Nothing suggested that the violent events, the problems with the labour conditions and, in fact, the entire plantation landscape of St. Croix in any way made Hagemann reconsider the appropriateness of his model. All problems were ascribed to external factors, not to the fundamental structure of the plantation itself.

Five months after the rebellion, he was anxious to restore order on the island and to see through his plan of connecting the plantations to the central factory. 'It must, it shall, and it will go well', he wrote in a letter to his wife. 'The island breaks down if the factory breaks down'. Only the factory could save the island, he wrote and added 'and then I will be the saviour of St. Croix' (Quoted in Vinding 1942: 143).

To study Fireburn in the context of fossilisation raises some important questions. According to Vincent Brown, we would do well not to consider the countless uprisings in the Caribbean throughout the colonial age as 'isolated and insignificant' (2020: 11) because they were always struck down (with the notable

exception of the Haitian revolution). Instead, they are all part of one pattern of war against the plantation. But while these contradictions no doubt are inherent to the plantation as a cultural landscape, it nevertheless raises the question: Why did the response explode when the plantation system was fossilised?

It was by providing better working conditions that the good old system showed its true face. On the one hand, Fireburn, which remains the largest labour insurrection in Scandinavian labour history, marked a new era in social relations. The enslaved labour and central authority of the plantation factory of the 'good old system' was replaced by a central factory and a migratory labour force which was formally free. On the other hand, however, by switching to fossil energy, the age-old pattern of the plantation was continued by new means. In fact, with fossil energy, it became possible to scale up the plantation to a hitherto unimaginable scope. Fossilisation both entrenched the subjection of the plantation workers and, simultaneously, opened new avenues of resistance.

Genealogy of fossil colonialism

These episodes do, in fact, have some possible answers to a question I raised earlier. Namely that the idea that it is the factory which determines the value of the landscape originates in the colonies where abstract space was first created. Under mercantile relations, the factory was a colonial invention designed as an instrument for generating revenues for the absolutist monarchies at home. The sugar factory extracted fertility from one end of the world and turned it into value to be realised in another. Slavery was a means to realise this cultural value. The birth of liberalism, which overthrew almost everything of the old order, kept the idea and even raised it above most other concerns. The factory, as Susan Buck-Morse (2009: 101) pointed out, colonised Europe from the colonies. But once this metabolic link has fossilised, it becomes increasingly difficult to see where the colony stops and where modern industrial society begins.

The fossilisation of this world did not bring an end to the colonial structures. 'While coal enabled an extraordinary concentration of production and population at the sites, close to coal mines, where industrialisation had first occurred', Timothy Mitchell noted, 'the need for materials unavailable in the industrial regions, such as cotton, sugar, rubber and gold, encouraged the expansion of mining, plantations and colonial settlements across wide of the non-European world, along with railways, banking firms, investment capital and imperial armies' (2013: 84–5).

In one outstanding example of transnational historiography, Angela Zimmerman showed in empirical detail how sugar beet in Prussia was directly

linked to colonisation processes in Africa as well as the American South. 'Like the American South', she continued, pointing to the inherent coloniality of the history of sugar beet,

> the German East produced agricultural staples—grain, and later, sugarbeets—on large estates employing unfree labor, serfs, until the nineteenth century, when these agricultural enterprises were forced to deal with the legal emancipation of their workers. Like their American counterparts, German landowners, policy makers, and workers struggles over contradictory meanings of free labor. At the root of these conflicts was the question of whether free labor meant the autonomy of workers or new regimes of labor control. Academic and political elites, both in Germany and in the Unites States, rallied to the cause of landowners, helping to keep formerly bound laborers, as well as their children and grandchildren, on the land of their erstwhile masters, carrying out the oversupervised and underpaid work of staple cultivation (2010: 66–7).

The meaning of freedom, as seen from the perspective of labour, came to define the terms for social theory as fossilisation subdued the world (see Chapter 2). It was impossible to theorise without engaging, explicitly or more often implicitly in these questions. 'Karl Marx, even during the American Civil War, began to contextualize that sectional conflict as a global war over the freedom of labor,' Zimmerman wrote:

> The German Social Democratic Party, the strongest Marxist party in the world before the October Revolution, continued this struggle over the meaning of free labor both in their theoretical writings and in their political work. German academic social scientists provided an antirevolutionary counterpart to this social democratic perspective, looking to postwar America for models of the constraint of free labor, particularly in agriculture (2010: 67).

In *Capital,* Marx openly declared the connection between fossil capital of the British kind and the colonialism overseas when he famously wrote:

> Whilst the cotton industry introduced child-slavery in England, it gave in the United States a stimulus to the transformation of the earlier, more or less patriarchal slavery, into a system of commercial exploitation. In fact, the veiled

> slavery of the wage workers in Europe needed, for its pedestal, slavery pure and simple in the new world (Marx 1976 [1867]: 925).

Another founding father of sociology, Max Weber, was himself deeply involved in the eastward colonisation of Germany into Polish areas. Along with the rest of the *Verein für Sozialpolitik,* according to Zimmerman,

> These social scientists advocated family farming carried out under landlord or state supervision as a means of controlling free labor, a program adopted by the Prussian state under the name of 'internal colonization'. The Prussian state also pursued internal colonization as a national or even a racial struggle, settling German farmers in predominantly Polish areas in eastern provinces of the kingdom. While today most would regard Poles as an ethnicity rather than a race, it was not uncommon in the years before the First World War to conceive of Poles and other 'ethnic' groups as biological 'races' (2010: 66–7).

Zimmerman goes on to describe how 'improved rail and ship transportation on which German workers escaped eastern estates also forced these estates to compete with foreign agriculture' (2010: 72). Under these conditions of free trade (particularly after the lifting of the Corn Laws in England), sugar beet farming became one lifeline for the old hierarchical estates to survive in the new world. But sugar beet demanded labour and fertilisers.

Rather than having been abolished, agrarian fossilisation seemed to refashion the old colonial questions of race. In any case, colonisers—in the new world and the old—did not, as the Marxist historian Patrick Wolfe showed, 'set out to create racial doctrine. They set out to create wealth' (2016: 52). Itself the product of the science of a country without sugar colonies overseas throughout the 1700s, 'German agronomists introduced the imperial beet in the 1840s, a hardier plant with a higher sugar content than its predecessors' to be processed in the four hundred sugar refineries that were found spread across the plains of the kingdom in 1896', as Zimmerman (2010: 82–3) points out. 'Between 1880 and 1910, the peak of German emigration from the rural northeast, German sugarbeet production nearly quadrupled' (Zimmerman 2010: 82). At that point, it seemed that something much like the plantation had been institutionalised on large tracts of ploughing Europe, only now it moved around in the landscape wherever the fallow used to be.

No matter how extraordinary the revolutionary changes in the political system—the abolition of slavery and serfdom—and its ideology—from hierarchy

to equality (of rights)—something remained the same. Energy was still extracted from some areas of the world, its roots being cut and sent into circulation where it finally ends up being consumed somewhere else. The conceptual thread which runs back and forth between the plantation and the factory, the fossil and the colonial, was a metabolic thread. Although energy and commodities changed hands through exchanges which were formally equal (a dollar for a pound of sugar), the structure of this production was not equal (Hornborg 2021). Fertility continued to wander from colony to metropole and from mine to field.

At the end of our genealogy, which began with contemporary beet farmers, we find that the plantation was among the first landscapes to be fossilised. Sugar beet and sugar cane are tied together not only as the two primary means through which capitalism produces sweetness, but also in the landscape systems of the central factory, pipelines and sleepless lands through which the sugar flows. As ecological structures, both industrialised agriculture (what Hagemann and the farmers called *vexeldrift*) and the plantation (under slavery *and* under fossilism) are extractive modes of cultivation (see conclusion). For the fossil plantation to operate, the old extraction of colonial lands for the satisfaction of metropolitan tastes is accompanied by an appropriation of new sources of fertility and labour by the means of coal. The old pattern of uprooting people from one continent to another was even accelerated as plantation owners on St. Croix found their own workers to have too many roots in the landscape. This pattern, too, followed when coal, sugar beets, pipelines, central factories, and consultants arrived in Scandinavia a few years later. There, the relation of extraction was slightly different. Instead of exhausting the soil directly, the Scandinavian beet fields appropriated fertility from subterranean sources.

While it would be possible to pursue this genealogy further back in time, to try to locate the historical preconditions of the plantation system itself, this would move us away from the fossilisation of Scandinavian farmers. Instead, we will now move forwards in time to see what happened since. For while it is the case that the birth of the sleepless land was very much moulded on a colonial blueprint, Scandinavian farmers, who largely remained self-employed as they fossilised, undertook another journey through the Anthropocene than the colonised.

4 *Coal and peasant kinship*

Fossilisation, as we have seen, established the factory's sovereignty over the terrain. Through pipelines and railways, agricultural labour shaped a cultural landscape in the image of exchangeability. So far, I have mainly treated fossilisation from the perspective of what we might call its political ecology in the widest possible meaning. Beginning in a certain aesthetics (reflected negatively in weed shame), it was a technological phenomenon that related to ecology, to class contradictions, to economics, politics, even to race. As such, what we have seen so far has been the application of the theories of fossil capital to an area (agriculture) where it had not been applied consistently previously. And while some empirical findings may appear novel (for example the fact that fossil fuels seem to colonise the fallow), the perspective has been in line with previous research (Malm 2016; Mitchell 2013).

With one hundred pages behind us and one hundred pages to come, it is now time to change perspective again. If fossilisation is indeed a total social fact, then it should be possible to study how it transformed everyday life also in the domestic sphere. This seems even more urgent, as fossilisation through its ideology of exchange creates the illusion that everything is for sale. As Malm (2016) demonstrated, there was capitalism before fossilisation, but it was as if the landscape of wind, water, and muscle energy constituted an obstacle to the abstract environment in which capital thrives. Likewise, fossilisation penetrates beyond the realm of capitalist relations proper, as the case of the fossilisation of simple commodity producers like farmers and fishermen attests to. The curious relation between fossilisation and Stalinism, too, is an example which needs explaining. Regarding the latter, Malm (2016a: 240) suggests the term fossil Stalinism be defined as 'the maximisation of the power of bureaucracy by means of fossil fuels'. Such a reading, no doubt, echoes important chapters in recent history (cf. Mitchell 2013), but one central point remains: It is capital, and not bureaucracies or simple commodity producers, that first fossilised the world. 'Chronologically, causally, historically, the link between the fossil economy and capitalism appears far more intimate' (Malm 2016a: 241). What fossilisation offers, then, is an analytical perspective on what happens when the frontier of capitalism—the home, the field, the state, family—is tied to the burning of subterranean sunlight.

But, in any society, some things are not for sale. There are always things one must keep for oneself, to use a classic anthropological phrase concerning what constitutes the sacred (Godelier 1999: 36, 200). Kinship, then, offers us a language and a perspective on fossilisation that runs counter to its own dynamics. By embarking on this venture, I also hope to contribute an ethnological perspective on fossil theory which not only expands the field of study, but also transforms the scope of analysis.

If there is one thing which has been sacred, and remains sacred to this day, among Scandinavian farmers, it is the family farm itself. Even though it has, in a legal sense, been private property for more than 150 years, it still should not be treated as a commodity. According to the farmers themselves, it is more accurate to say that they belong to the farm, rather than the other way around.

Village politics

A short story found in the Folklife Archive in Lund frames the contradictions of the family farm well. Categorised under several keywords (including *släktgård*, family or 'kin' farm), it went like this.

> Svante Larsson was tired of being a roughneck. Instead, he wanted to get a farm of about 20 acres of land. For a long time, he had been a poor guy, so he had to save a lot of money to buy a such a large place. One day, when he was reading the newspaper, he saw that such an estate was for sale. In the advertisement, it was mentioned that all furniture was also included in the purchase.
>
> Svante began to think about this, and a couple of days later, he put long boots on his feet and walked the route (roughly twenty kilometres). When he arrived at the farm, Per Hansson—that was the owner's name—was standing in the main building. Svante greeted him and said his business. The two of them immediately began to talk and got along well, but after they had talked for a while a moment, Per Hansson said:
>
> 'Then it's good enough that we can go and look at the creatures'.
>
> Svante and he went and looked at horses, cows, sheep, and all the living animals that were on the farm. When they had looked at them, they took one another and the agricultural implements into consideration. Per said his price and Svante tried to bargain with him.
>
> 'There will be no haggling here', Per said. 'We don't fight over pennies'.
>
> As Svante found Per's demands reasonable, the deal was soon done.
>
> 'Yes, then I guess we will go take a look at the girl', said Per Hansson.
>
> 'The girl? Which girl?', Svante asked.

> 'The girl, my girl Anna, you know, she has no one', Per continued and added. 'You understand that the one who gets the place gets the girl, too'.
>
> Svante got a bit bewildered, but he agreed to it and said: 'as long as he liked her, and she him', then everything would be well (LUF M9641).

Much more than more conventional types of ethnographic evidence, stories of this type cut right to the core of agricultural life: The farm represented a paradox. It was a commodity which you can sell through a notice in the newspaper. But it had people attached to it!

Was the girl Anna sold in the deal as a part of the furniture?

I don't think we should read the story as one about slavery (father sells his daughter to stranger). It would be more accurate to say that this story from Skåne, which was told to an ethnologist in 1945, tells us that even though the farm might be private property like anything else (a pound of sugar or a table), it really should not be treated as such.

The family farm has its own moral imperatives.

To become someone (a peasant), the protagonist needs to get his hands on a farm, otherwise he will just remain a 'roughneck', that is, a man working in the pits. I wondered if what happens is that the farm recruits a new man, rather than him acquiring it. The estate he wants to acquire is 'big', 20 acres (10 hectares). Likely, this is what in Sweden was called a 'half farm', implying that it only had half the land of an 'entire farm'. Depending on the circumstances—the mode of operation, the quality of the soil—20 hectares of arable land made up one unit of taxation, called 'one plough' or a plough's land (*plovland*).

There was never a time when family farms existed in natural neutrality. Instead, they were always politicised both from those living inside them, and elites who tried to mobilise them for their own political and economic purposes. Conservative agitators, for example, saw in the peasantry a class which had to be mobilised against the moral dangers brought about by modernity. Nils Wohlin was one such agitator in Sweden who wrote a government memo with the telling title *The Danger of the Undermining of the Peasant Class* (1910). 'The peasant class', he (1910: 106) wrote, 'must overcome the selfish and business-like views which may well in other occupations be the driving force for progress, but which are not suitable for a country's agricultural class'. Agriculturalists 'must inevitably be animated by other ways of thinking':

> Of course, this does not exclude the endeavour to make agriculture as profitable as possible and to defend their own economic interests against other social

> classes. But behind these commercial considerations there must be a feeling for the land itself, for the memory of the family farm and the traditions of the family, which is less in question among other social classes. For the agricultural class, the land must regain its special character as opposed to movable property (Wohlin 1910: 106).

While in practice having the status of private property which could be bought and sold, the family farm really should not be treated as such. In the first case, when a farm changed hands, so did the people that belonged to it. In this case, cultural resistance against such exchanges is considered a necessity on moral grounds. 'The word family farm (*släktgård*) has a good sound in Swedish ears', wrote another moralist (Örjangaard 1947: 11). In it, 'the pride over the Swedish peasants' ancient freedom' is mixed with the 'rule of law' of peasant society, democratic self-governance and the 'sense of security through the inherited land, of continuity in the development and accumulation of strength through generations of work for the coming generation'.

The family farm was clearly important both culturally and historically, but I had my doubts whether it was in fact as ancient as these conservative politicians would have us believe. While many scholars agreed that a family farm did represent something distinct, perhaps even a kinship structure of its own, few had, as far as I could work out, sought to connect it to the process of fossilisation, which must have changed the way it worked significantly.

What the older ethnologists were instead concerned with was the internal power balances and lines of succession in peasant farming. In 1921, a founding father of Swedish ethnology, Sigurd Erixon, argued that the peasant farm was an inherently patriarchal institution. Even in cases where the farm was passed on to the daughter, her husband, a stranger and a son-in-law would nevertheless rule in the house (Erixon 1921: 195–6). As we saw in the introduction, Börje Hanssen later objected to this depiction, painting a more nuanced picture of the balance of power between the genders. 'As long as there was a lack of manpower so that any able-bodied person could be a farmer', he wrote,

> the contribution of women's work was of equal economic importance to that of men's. But the egalitarian balance between the spouses changed as the husband had male hands and adult sons for helpers. A more pronounced division of labour crystallized, placing more domestic duties with the mistress of the house. Female hands and daughters could be put to outdoor work in the stables and the fields. This development gave the house-wife more authority

> over the women while the husband had a certain advantage over his wife, as his work carried the greatest economic weight (Hanssen 1979: 99).

Even if it is probably true that in most cases there was some form of male dominance at work, the ethnological task seemed to me to be to determine what conditions might favour patriarchy, on the one hand, and egalitarian relations, on the other. Hanssen's work also attacks the idea that the peasant farm was caught in some preindustrial blur by drawing up some epochs in its history. From the Middle Ages until sometime around 1800, give or take a few decades, the peasants lived under feudal relations of tenancy and corvée. At that time, the peasants had few ways of influencing who was in charge on the farms. Instead, it was the feudal lord or his bailiff who appointed the next head of the household when the old peasant died or retired. Without the ability to pass on the farms as property, a spirit of equality tended to reign among the commoners. Bloodlines mattered less than hard work in a landscape where authority ultimately lay at the manor.[15] Hanssen (1979: 103) called the social system among the peasants under this kind of feudalism 'commensalism', or a kind of everyday communism at the bottom of the feudal hierarchy.

With the great agrarian reforms around year 1800, a process began across Scandinavia, turning almost all peasant land into private property.[16] The first step was to tie plots of land to individual farmsteads, which brought an end to the old communal mode of operation where the entire village coordinated the ploughing, sowing and harvesting of all the fields. These enclosures, as the Swedish economic historians Erik Bengtsson and Patrick Svensson (2019: 130) highlight, 'led to a stratification of the peasant-farmer class'. The next step was the introduction of making the position of tenant farmer something to be inherited and not appointed by the bailiff. In most places, it was only after these two things had occurred that private property of the modern kind was implemented. Often, the peasants had

[15] Of course, there were cases of hierarchies and successions before then. In some areas (often those with few resources which the ruling classes were interested in monopolising), the farmers did own their own farms before the age of the great reform around 1800. In other cases, some tenant farmers may have succeeded in persuading the local lord to grant a certain son the lease upon retirement or death, thus creating lines of succession under feudal protection.

[16] This process, which took place before fossilisation, was in many respects a long and complex one with many local, regional and national nuances and speeds. The overall direction, however, was remarkably uniform across these differences, and it went in the direction of private property. The comprehensive research within agrarian history has dealt extensively with these changes as a result of top-down efforts to maximise productivity (Herlitz 1974), of internal power struggles within the feudal élites (Hansen 2025) or of a growing entrepreneurial spirit among the peasants (Svensson 2006). For the British case, Allen (2009: 58–79) provides an informative account.

to buy the land from the lords, turning themselves into owners and the farmstead into a commodity. Hanssen (1979: 96) called this the 'mastery stage'. The house crystallised and the farmers became a kind of peasant nobility.

There are several implications of our shift of perspective towards a 'fossilisation of peasant kinship'. First, it sensitises us to take seriously what the farmers take seriously, namely kinship relations and the perpetuity of their family farm. These relate to ethnographic sensitivity to how people think and feel about their own life. These are aspects which are much too often overlooked or dismissed as 'false consciousness' by approaches that focus only on political economy. An ethnological theory of fossilisation, on the contrary, needs to take them into account.

But attention to kinship also provides another angle from which to look at history. Lévi-Strauss (1987: 151) gave us the concept of 'house' to think with and to show 'a type of social structure hitherto associated with complex societies is also found in non-literate societies'. Thus, in this view, societies or landscapes with 'houses' stand with one leg in the civilised world and one in the 'primitive world', here taken to mean a world where kinship still dominates social life.

> It seemed that they (the houses) originated in a structural state where political and economic interests tending to invade the social field did not yet have distinct languages at their disposal and, being obliged to express themselves in the only language available, which is that of kinship, inevitably subverted it (Lévi-Strauss 1987: 152).

Seen from this point of view, there are two ways of looking at houses like the ones which have dominated the Scandinavian plains for the past few hundred years. One the one hand, they may be studied as a window out of the nuclear families that accompany capitalism and as a structurally different way of organising kinship, behind which lie other, even more exotic, ways. But a landscape scattered with 'houses' is not a transcendental system any more than any other kinship structure. It is constantly recreated in daily life. For, as anthropologist Janet Carsten (1995) demonstrated for Malay houses, what is at stake is dwelling, eating, giving birth and dying together. In this chapter and the next, then, kinship is understood to be premised on childcare, domestic metabolisms, and mechanisms for social exclusion.

The houses may also, on the other hand, be studied as a structure which has responded and adapted to history. It is to such a reading that the rest of this book is dedicated. If the peasant house is in fact an institution which still speaks the

language of kinship, then it should be possible to demonstrate how houses have responded and readjusted to a world of fossilisation. Fossilisation did not create peasant houses in Scandinavia, but it did, as we will see, transform them fundamentally. Family farms may well be living myths which generate 'the appearance of stability, an illusion of timelessness that cannot be affected by the changes in the world' (Gow 2001: 11), but how have they responded to wave after wave of fossilisation?

The first wave of fossilisation was powered by coal (Chapter 2 and 3). For the farmers on the plains, as we have seen, it was first felt in the form of novel technologies like steam ploughs, threshing machines, cream separators, pipelines, railroads and steamships as the 19th century was coming to an end. But while all these things at first seemed like external novelties, they soon enough transformed internal relations of gender and class among the family farmers in Scandinavia.

Until this time, 'the energy needed to sustain human existence came almost entirely from renewable sources, which obtain their force from the sun', as Timothy Mitchell (2013: 12) put it. Fossil energy is, of course, also the result of sunlight because it is nothing other than the biomass created by photosynthesis in the past pressed together into a much more energy-dense form than, for example, wood. The difference is that fossil fuels are ancient sunlight, while the renewable sources which Scandinavian peasants lived off were harvested within a few years after the sun had shone, or a lifetime in the case of most trees. Coal, on the contrary, was condensed sunlight which shone in the Carboniferous Period around 300 million years ago. 'When most energy was derived from widely dispersed renewable sources', Mitchell (2013: 18–9) added, 'a significant part of the population was involved in the work of generating and transporting energy, in small amounts'. Consequently, the people involved in this, too, were widely dispersed.

According to ethnological kinship theory, the shift from renewable to fossil energy should not only be seen as a quantitative shift from scarcity to plenty, but also as a qualitative transformation of the fundamental relations between people. Material relationships such as these, as the quote from Börje Hanssen (1979: 99) above illustrates, shape conditions for egalitarian and hierarchical social form, and, by extension, the whole kinship system in which people grow up.

With testimonies from farmers who lived through the transition, the following chapters will explore how this dynamic changed farm life at the turn of the 20th century. In particular, the accounts of one extraordinary informant will form the empirical basis for the discussion of how coal changed peasant kinship.

Farm life

In December 1955, Jens Madsen sent a letter to the National Museum of Denmark from his farm in the sugar districts near Nakskov, Denmark, saying that he would like to become an informant for them. Retired as he was, he had plenty of time to write his memories of how things were done in his childhood in a small village in the sugar districts at the end of the 19th century. Ole Højrup responded, thanking Madsen for his participation and attaching a survey about servants in the pre-industrial household. Around a month later, 35 typed pages arrived describing in great ethnographic detail the farm, its people and the work carried out there.

Thinking back on his childhood, the peasant Jens Madsen remembered how, in wintertime, the people got up at five in the morning. The girls milked the cows with the help of their mother, until she left to prepare the breakfast. The farmhand cleaned the horse stables, groomed them, and rode them to an open pit where they could drink. The boy cleaned the cow stables and spread straws under the cattle. The 'father of the house' fed the horses, the pigs, and the calves. At six o'clock, they all went in to eat salted and boiled Norwegian herring on rye bread. The grown-ups had snaps with it. Then a large clay bowl was placed on the table. Everybody ate skimmed milk with ryebread cubes directly out of the bowl with their own personal spoons, engraved with the owner's name on it. When everyone was satisfied, the rest of it was fed to the pigs (NEU 23,848: 3).

In the old days, he wrote, the farmhands were mainly recruited from neighbouring farms or among the children of craftsmen. But with the arrival of the sugar beet, foreigners from Sweden or Poland became a part of daily life. The alterity of these workers, who were clearly foreigners of another kind than the farmhands and maids who steadily moved into and out of the farmsteads, was marked by the fact that they were given a cooking fire of their own. Somehow, they were not part of the household, which was dialectically related to them eating by themselves.

But before then, when Jens Madsen was still a child and no sugar beets were cultivated, the second meal was served at half past nine. Rye bread again, but this time with cold cuts, beer, and snaps again. At twelve, the women served porridge. At other times, they had prepared a soup based on chicken, veal, or pig, but the latter was salted and had to be watered out the night before. After this, they slept for an hour during winter, and an extra half-hour in summer. Before resuming work, they drank half a litre of coffee and ate a little piece of sugar which, before, say, 1880, must have come from St. Croix.

During the afternoon, it was customary to serve salty meat dishes or fried bacon around four. Only during the slaughtering season in fall when fodder was becoming scarce did the 'housepeople' (*husfolket*) eat fresh meat. At seven in the evening, the women served a final meal of milk porridge with barley grains, rye bread and butter. By nine o'clock everyone was back in bed.

A typical village on the plains consisted of around ten farms (*gårde*), but in the fertile parts, sometimes upwards of 20 (Porsmose 2008: 54). Since the privatisation of land, many owners had relocated their houses from their old position in the village out to their own 20 or 30 hectares of land. There would usually also be a handful of cottages with just a few acres or none. Every 10 or 15 years, on a day chosen in advance, a man would visit all the farms and houses in the entire country and record who was present.

Each household was designated according to its status as either a house (no or very little land), *parcellist* (too little land to live off) or a farm, which signalled prestige and plenty. In 1890, everyone in the material I have consulted was a member of the Church of Denmark and, thus, naturally Protestant Lutherans, at least in the eyes of the law. Everyone was also divided into one of two genders, *Mandkjøn* (male) and *Kvindekjøn* (female). The surveyors, who were trusted people with local knowledge, also had to write down the age and marital status, as well as place of birth, position in the family and line of business. For Jens Madsen's household, the 1890 census reads as follows.

Lars Madsen (m, 37), married, Nebbelunde, House father, Farm owner
Klara Madsen (born Madsen) (f, 34), married, Søllested, House mother
Jens Madsen (m, 9), unmarried, Søllested, child
Steen Madsen (m, 3), unmarried, Søllested, child
Mette Madsen (f, 74), widow, Søllested, retired
Lea Jensen (f, 17), unmarried, Søllested, maid
Emil Jørgen (m, 19, unmarried, Sædinge, servant

The household consisted of a married couple with their two boys, the wife's widowed mother and two servants. Both mother and daughter had been born on the farm. The fact that they stayed after marriage meant that for two generations, the husbands were recruited from the outside; in this case, Lars came from Nebbelunde, a four-hour walk to the south.

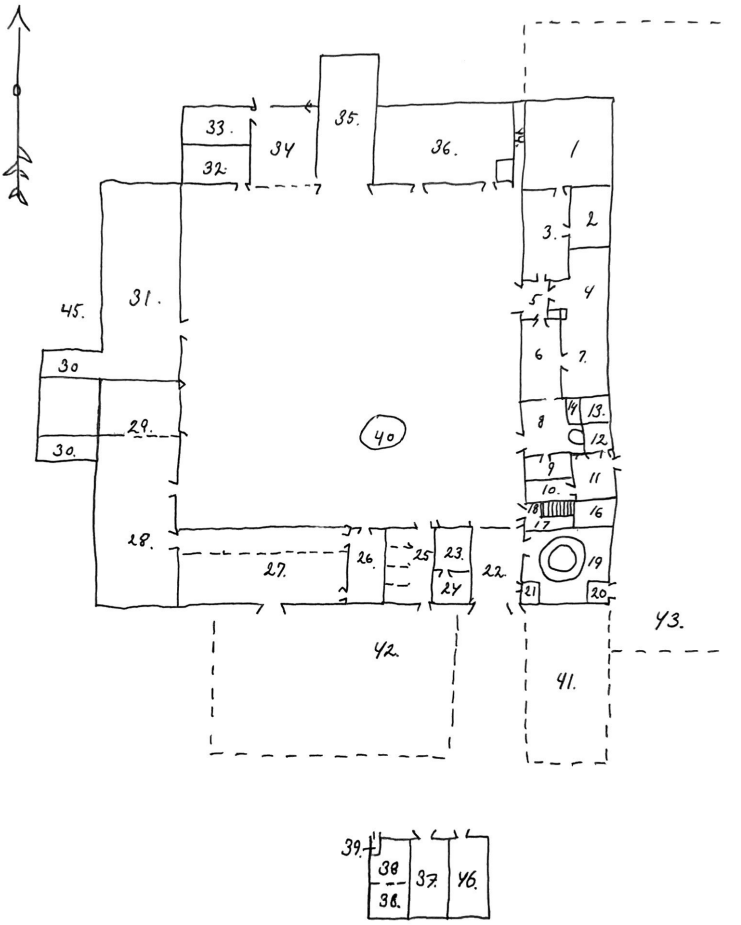

Figure 19. Jens Madsen's drawing of his childhood farm, containing the following rooms: 1. The ceremonial room (*storstue*) 2. Guest room 3. Living room 4. Pensioners' room 5. Entrance 6. Common room 7. Bedroom 8. Kitchen 9. Pantry 10. Basement 11. Utility room (*bryggers*) 12. Maid's room 13. Baking oven 14. Open chimney 15. Kettle 16. Grinding room 17. Tool shed 18. Attic stairway 19. Horse mill with wooden wheel 20. Women's closet 21. Hens house 22. Drive-through 23. Wagon shed 24. Farmhand's room 25. Horse stable 26. Fodder barn 27. Cow stable 28. Rye barn 29. Threshing floor 30. Fodder cabin 31. Wheat barn 32. Sheep house 33. Geese path 34. Driveway from the street 35. Threshing barn 36. Barley barn 37. Carpentry 38. Pigsty 39. Retreat of the menfolk 40. Well 41. Woodpile 42. Heap 43. Garden 44. Passage 45. Hops garden 46. Woodshed. Redrawn by the author after Jens Madsen's original.

Emil, the servant, was from the same village. Lea, the girl who served in the house, was from another farm in the village.

According to Börje Hanssen (1979: 78) who worked with empirical material from the sugar district of Österlen in Sweden as well as Danish sources, the collective of people living on the farm called themselves the *gårafolket*, the people of the farm or house. Once these farmsteads had been recognised by law as the unit of social organisation in the countryside, the issue of inclusion and exclusion became the most essential concern for *gårafolket*.

His maternal grandmother, Mette, cared for Jens Madsen the first years of his life while his mother was busy keeping the household up and running. 'From I was about six months old, it was mostly Grandmother (*Mormor*, literally mother-mother) after being washed and made proper in the morning' (NEU 25,522: 3). His mother was, together with the servant, busy cooking all the meals and taking care of the pigs and calves as well as milking 12 to 14 cows two or three times a day. Thinking back, he remembered how he how spent the first years of his life following her everywhere she went: in the house, in the gardens, with the animals.

He went to feed the pigs and found it funny to watch the little piglets feeding on their mother. When they grew a little, they would get into a fight and crawl on top of each other to reach the teats. Later, they got a trough of their own to drink cow milk from.

It was also a child's job to take the geese out to a grass field in the morning and bring them back in again at night to protect them against foxes. 'In the first years and through school, you didn't get any reward for the chores, so it was a matter of seeing and trying something new and experience something interesting; you didn't think that money existed to buy things with' (NEU 25,522: 6). But besides the people born or married into the house, there were, as we have seen, young people residing there. After confirmation, many youngsters, male and female, left their birthplaces and went into circulation.

There does not seem to have been any fixed pattern of who stayed at the farm and who had to leave. In some cases, the eldest son would stay at home after confirmation, having been taught day-by-day, year-by-year what it meant to run the field and the household, two aspects which could hardly be separated, as one supplied labour and the other energy. In other cases, such as the example above, it was the younger of two brothers who stayed and the older who left. The moving out of most young people sketched a pattern of mobility which anthropologists have called 'European life-cycle service' (Laslett 1977; Hajnal 1982; Lundh 2003). In the years between confirmation (around age 15) and marriage (perhaps in the late twenties, depending on circumstances), most people did service in other

households. Once living on the farm, they belonged to the housepeople and would address the husband as 'our father' (*vånnfar*), a term also used for a retired grandfather (*far*) (Hanssen 1979: 78).

Contrary to the situation in the plantation colonies and in the English landscapes, the independent peasant freehold remained the most important form of agriculture in Scandinavia far into the Anthropocene. With twenty or thirty hectares of arable land around the occasional manor or the scattered cottages, the farmsteads made up an entire world for the peasants and continues to do so today (see Chapter 1 and 5).

Ancestors

In what read almost like an excerpt from certain South American novels, Jens Madsen told the story of the farm on which he was born. The circulation of names in a cycle, which makes it difficult to see where one generation stops and the next begins, contributes to a sense of continuity within the house. Names are often recycled but turned around so that the son of Mads Jørgensen will be called Jørgen Madsen and so on. 'It is told', Jens Madsen remembered,

> that in 1803 a man arrived from Funen and that from the owner on Søllestedgaard (the local manor), he received this farm in copyhold (a*rvefæste*, that is, he could pass on the land deed to his heir). His name was Jørgen Madsen and would become my great grandfather (*oldefar*). He was married, and there came four children in the wedlock. The eldest son was called Mads Jørgensen and was born on October 10th, 1809. There was a brother who was born around 1812 Lars Jørgensen. Afterwards there were two daughters of whom I don't know the name. They were later married and resided far away from home. . . Jørgen Madsen died relatively early from blood poisoning and the oldest son Mads Jørgensen had to manage the farm for his mother until he took over the lease of it towards the end of the 1830s, and was married to Mette Larsdatter (literally, the daughter of Lars). Her home was near Hillested Church. It was a farm which her brother Peter Larsen, called 'the hair', took over from their parents. Mette Larsdatter was born there on the farm on April 25th, 1816. She told that when they had the cows on grass during summer, she walked to milk them and put the wooden bucket with milk on her head fixed with a garland of clothes. She had a wooden chip in the milk to keep it from splashing over, and then she walked while knitting (NEU 21,681: 2).

Mads Jørgensen and Mette Larsdaughter—who became Jens Madsen's maternal grandparents—took over the lease of the farm before 1840. They had two sons—Jørgen Madsen and Lars Madsen—born in 1842 and 1844. The eldest one married into another farm in a faraway village, the younger one married into a farm in the neighbouring one. In 1855, they had a girl, Anna Madsen. When she was twenty years old, her parents bought the farmstead and its 53 barrels of land from the manorial lord for 30,000 kroner.

The daughter stayed at home. Three years after her parents bought the farm, she married a man Lars Madsen who immediately moved in with this parents-in-law. Not long after, the old ones retired, which meant that they moved to another room in the houses, helping to take care of the children while the new generation took over the responsibility of running a household. Jens Madsen was born soon after in 1880. For the first years of his life, he preferred to sleep in the same bed as his maternal grandmother (*mormor*), Mette (NEU 21,681: 5).

The story makes it clear that fossilisation did not create a new kinship structure immediately. Instead, it arrived in a landscape where 'houses'—that is, estates with land and symbols to be handed down undivided—already existed. The story told of two major changes. First, when Jørgen Madsen arrived from Funen around the turn of the 19th century, the old feudal contracts had already been modified into inheritable arrangements. The land or the houses were not private property in the modern sense. They could not be sold or bought freely. The new element was that the contract signed by the landlord who received labour or products and the tenant who provided them could no longer be terminated at the former's will. Instead, it was passed on to the latter's heirs. This meant that, suddenly, a place in the landscape was accessed through blood relations, whereas earlier the landlord or his bailiff was free to select any man to succeed a dead peasant (*bonde*).

The second transformation brought an end to this arrangement when, in the 1870s, the copyholders bought the estate from the landlord. From then on, the house was now the private property of its owners, Mads and Anna Jørgensen. Legally, they could dispose of it as they wished, although the cultural restrictions were much less free.

The question, then, was how fossilisation changed the internal dynamics of the house immediately, and in the long term.

Whereas the houses analysed by Lévi-Strauss, both Kwakiutl and European noble houses of the Middle Ages, in the final analysis, defended their privileges violently, peasant houses depended on the state (Godelier 2011: 94–5). Rather than being sovereign, they had to adapt to the changing policies of a state that saw shifting potentials in them. This points us directly to the history of agrarian law.

A thousand years ago, when the first written sources appear in Scandinavia, it was exactly questions of land tenure which occupied the jurists. The so-called 'landscape laws' dealt specifically with the rights and duties of land users, successions, and conflicts over resources (Hoff 2004: 433–6).

Ethnologists Thomas Højrup and Niels Jul Nielsen (2024: 128, 166), for example, argue that one reason why continental Europe has seen so many peasant freeholds and the British Isles so few in modern times, is that once people are established as owners of their own land, and as free producers, they have something worth defending. In the European context where the threat of invasion was ever-present for centuries, the peasant house, then, played the role of foreign policy. On the British Isles where military threats always came from the sea, there was little political incentive to cultivate peasant property. Instead, secured by a large navy, agricultural politics could turn to large-scale cultivation and true capitalist relations of production. Marx touched upon this point in *Capital*, noting that capitalism demanded the dissolution of the free peasantry with their houses. Marx quotes Francis Bacon, who praised Henry VII for protecting the freeholders, writing that the latter's agrarian policy,

> was profound and admirable, in making farms and the houses of husbandry of a standard; that is, maintained with a proportion of land unto them as may breed a subject to live in convenient plenty, and no servile condition, and to keep the plough in the hands of the owners and not mere hirelings (Marx 1976 [1867]: 880).

What was good for the peasantry, it would seem, was bad for the development of capitalism and imperial power.

In kinship terminology, there was another difference between Scandinavian peasant houses and Indigenous American houses in the Pacific Northwest. Lévi-Strauss (1990 [1979]: 170) noted that the Kwakiutl as well as their neighbours who were also organised into houses, Nootka and Bella Coola, shared a language for talking about kinsfolk which made it impossible to distinguish a brother from a cousin. In keeping with the principles of classificatory kinship, all of one's cousins were simply called brothers and sisters. The effect of this system is that the intimacy and solidarity that ideally should exist between siblings is extended beyond the confines of the nuclear family.

The concept of the house, as offered by Lévi-Strauss, provided a point from which all sorts of strange peasant phenomena could be understood. It explained to my satisfaction not only the intense importance that farmers seemed to attach

their farms on the most general level. The house was also a way to understand the some particularly strange customs which had been reported from all around peasant Europe.

Throughout the 20th century, the children of Swedish peasants could be observed to stay at home for their entire lives. Instead of marrying, groups of sisters and brothers would live together, dividing the chores between them according to the usual pattern. Such 'sibling farms' were found in all regions.

From 1890 to 1910, as the historian Martin Dackling (2018: 210) points out, their number doubled, and then again until 1930. Particularly, it appeared that it was larger farms which resorted to siblinghood in place of marriage. In most cases where there were both brothers and sisters in place (and not only brothers), the people divided the work along the ordinary lines of gender. The men took care of the fields and the machines, the women managed the household. Once recognised as private property, an 'ideology of kinship' emerged to secure the continuity of the estate with the growing cultural significance attached to family names (Dackling 2018: 219).

'By putting, so to speak, "two in one", the house accomplishes a sort of inside-out topological reversal', Lévi-Strauss wrote, 'it replaces an internal duality with an external unity' (1990: 184–5). All principles known to kinship, endogamy and exogamous, close and distant marriage, descent and alliance, are rendered interchangeable. It was, therefore, hardly surprising that some houses would find a solution to their own perpetuity that involved consolidation around the heirs themselves. By rendering marriage superfluous, equality was achieved, at least formally, among the heirs. No one was excluded to the benefit of a spouse coming from nowhere in to take over.

The price that these sibling farms paid, of course, was in the form of recognised marital relations. And, as Martin Dackling (2018: 15) notes, it was not the case that such farms were entirely free of hierarchies between the siblings, and resolving those hierarchies also created another problem. How was the house to find the next generation of heirs?

Buying some property

The week he turned 28, Jens Madsen bought a farm.

At that time, he had already been working for five years as a travelling control assistant for local dairies, taking samples of milk, measuring it to ensure the quality of the product, which was beginning to leave the landscapes in large quantities on railroads and steam ships before ending up as butter on breakfast tables in England.

He circulated between ten estates, some farmsteads, others large manors. On the larger ones that comprised several hundred hectares, he stayed for three days taking samples of each of the 200 milking cows that lived there along with 30 or 40 horses, 200 pigs, and many people.

> Apart from the director and wife and three children, boys in the age three to nine, there was a housemaid, five girls of which three took part in the milking, one manager, one feed master, 14 farmhands, 10 regular crofters; there was a married pump master living on the estate's pumping station where the water from the entire area of the farm, including the sewers from the town Nakskov was pumped out into Nakskov Fjord by means of a steam engine and a water mill which also grinded the flour for the estate's own consumption. There was a master of the meadows who managed the irrigation of the meadows with the sewer water coming from the towns. There was about one hundred barrels of land of dammed land which was irrigated, and it provided very abundant pasture. There were also seasonal workers. One Aufcher (Overseer) and 40 Polish girls to weed and lift the sugar beets (NEU 21.408: 19).

On the farmsteads, he stayed just a single night. The owner of one such 25-hectare estate could take care of his four horses, thirteen milking cows, five heifers and 12 pigs with the help of his wife, two sons and two daughters, provided they stayed at home. If they had taken up beet cultivation, two or three Polish girls would also be living there from April to November.

In the beginning, he was driven to the next farm by the people he had just visited. But, as time passed, it was considered too much a drain on the resources to be without one man and one horse for a whole day every other week. Instead, the chairman of the dairy association suggested that Jens Madsen would be compensated with 100 kroners a year to buy a horse of his own. The deal was that the farms he visited were to provide the fodder necessary for the horse. He agreed and bought a black mare of a local variety.

He had saved up some money, and he had, as he later wrote, 'the purchase of some property in mind'. One day, the owner of a large estate asked him to take the position as treasurer in the local bank which he had helped found and was now the chairman of. He rejected the offer because he had no desire for 'stuffy work' indoors (NEU 21.681: 20). Luckily for him, soon thereafter, he heard about a farm for sale.

Having earned 400 kroner a month for five years, plus one hundred kroner to cover his travel expenses, he rode to the farm with both savings and a desire to

have a property of his own. He paid 8,000 in cash and loaned the remaining 32,000, and then he moved in immediately. In the beginning, the old owner, his wife, and his daughter stayed in the house and cooked for its new owner, who was not yet thirty, and single. To help with the four horses, two foals, seven milking cows, one bull and four heifers, a crofter living behind the farm came to help, and the neighbour's boy was also there.

The former owners found a new place nearby and moved out a month later. In need of a housemaid, Jens Madsen hired a woman from the other end of the country to begin the first of November. 'The housemaid had to move again for New Year's because she had gotten pregnant', he later remembered (the sources revealed nothing about who the father might be).

This raises an important problem. If the house is really something which should not be bought and sold but kept within the bloodline, how are we to understand the fact that Jens Madsen bought his farm from a stranger? Does it mean the concept of the house is not applicable if people have historically treated farms so carelessly as to exchange them for money? Historical evidence, surely, confirms the idea that from the time, when farmland was turned into private property, it was enthusiastically bought and sold. In a survey of one Swedish region, for example, Martin Dackling (2013: 180–1) found overwhelming evidence of such transactions even though an ideology of peasant houses seemed to be spreading at the same time.

But the paradox of real exchange against an ideology of permanence is in fact a telling future of the house's mode of operation. While it is itself a historical phenomenon which, in Scandinavia, was the conscious result of a political process in which states turned their peasantry into freeholders, the interpellation immediately created an illusion of timelessness. It was only at the time of the creation of peasant property that ideas of a golden Viking Age began to be cultivated. Instead of viewing the houses as a true essence, we must acknowledge that it is nothing but the '*objectification of a relation*', to use Lévi-Strauss' (1987 [1984]: 155) own term. What is really a relation between people, constantly created and reproduced, appears to them as a thing that has value in its own right. It is this fetishistic character which allows the 'freedom to disguise social or political maneuvers under the mantle of kinship' (Lévi-Strauss 1990 [1979]: 176). Blood is important in theory, but in practice there are always ways to get around it. Jens Madsen's house, like any other house, was a recent invention, founded partly on a transaction, partly on a quasi-adoption, but very soon it *became* synonymous with blood relations, almost as if these were ploughed into the landscape.

'In the year 1908', Jens Madsen wrote, '230 barrels of grain were harvested at 10 kroner per barrel (100 kilos) and 1440 centner of sugar beet at 65 øre per centner' (NEU 21,681: 21). He used 2105 pounds of Chile Salpeter (10 øre per pound), 3,000 pounds of Superphosphate (3 øre per pound), and 100 pounds of sugar beet seeds (32 øre per pound). He then added the following list.

Prices on different commodities year 1909

1 litre whole milk 8 øre
1 litre skimmed milk 1.5 øre
1 Carlsberg beer 7 øre
1 Bottle of snaps 21 øre
1 Bottle of rum 85 øre
1 litre of petroleum 12 øre
1 pound of chocolate 100 øre
1 fat duck 200 øre
1 fat goose 400 øre
1 spade 200 øre
1 pair of clogs 180 øre
1 pound butter 90 øre
1 pound of coffee 90 øre
1 pound of wool yarn 175 øre
1 pound of wheat flour 11 øre
80 herrings 150 øre
1 pack of matches 10 øre
1 ryebread 5 øre or swap with rye

1 pound of meat 30 øre
1 harvest rake 100 øre
Newspaper, three months 100 øre
(NEU 21,681: 21).

This list is a testament to the transformation of house subsistence. A decade earlier, most food stuffs would have been produced on the farm and would therefore have no exchange value, only use value. But by 1909, milk, beer, butter, even wheat to some extent had entered a value chain where they were transported from the farm to the factory, where they would be processed using fossil energy to set the centrifuges and mills in motion. At the same time, the old willow hedges which had kept out the animals were felled and the wood burned (NEU 21,681: 21–22).

Among these new commodities, sugar (alongside coffee), stood out as having been a commodity arriving from nowhere for more than a century. Only now could beet sugar competed with cane sugar. These new patterns of consumption alongside new systems of cultivation (of sugar beet, for example) have been labelled 'the system change' in agriculture. Similar findings appear in what remains one of the most thorough empirical explorations of one individual farm, namely the agrarian economist S. P. Jensen's (1985) article. Based on an extraordinarily meticulous peasant diary, he showed the fundamental nature of the transition between 1870 and 1915 for one farm in Stevns, at the edge of the sugar districts. The result was that agriculturalists, also those for whom the

production of milk and butter, rather than sugar beet, was the centrepiece, were 'irrevocably linked to the "world market" conditions in terms of both sales and procurement' (Jensen 1985: 57). At that time, Jensen (1985: 56) wrote, 'the expression "progressive agriculture" was often used, or people spoke of a necessary transition from "predatory farming" to "replacement farming" in terms of soil nutrients'.

Paradoxically, what appeared as to individual farmers of the age as the overcoming of predation now appears to rest on a collective form of extractivism on a higher level. But when reviewing the evidence, Jensen (1985: 76) concluded that the 'myth of predation' was not valid. Instead, he found the old system to be an expression of clever ecological restraint. But the shift did have all sorts of consequences for the relations between the generations (the expertise of the elder soon appeared useless) and between the genders, for marriage was still a necessary element of the reproduction of the peasant house.

Jens Madsen went on to write that, 'Then I got Klara Madsen from Stokkemarke, who would later become my good wife. She got a salary of 15 kroner per month'. 'From the first of May 1909, we got a young girl, Mette Vangstrup from Stone Farm. She got 180 kroner for an entire year' (NEU 21,681: 20–1). This was about what he had to write about how he met his wife. A boy, too, stayed during the summer season and got 80 kroner for it. Jens Madsen ended his little list recording the expenses related to caring for the sugar beets.

> Thinning 1st time 100 fathoms 13 øre.
> ——— 2nd time 100 fathoms 9 øre.
> ——— 3rd time 100 fathoms 5 øre.

This was information worth remembering, for while sugar beet might have been the main avenue for getting his hands on some cash, it was also expensive. 'Towards the turn of the century', he noted, 'there was more need for labour for the sugar beets and since it was more difficult to acquire Swedes, efforts were made to bring Polish girls and boys here' (NEU 12,280: 34). These seasonal workers were contracted through a German intermediary (called an *Aufseher*, or 'overseer'),

> and distributed on the farmsteads two or three on each farm; they got a room and a kitchen with a stove; in the kitchen there was a bed for each, and a couple of chairs and they were given enough branches for firewood to cook their food. They lived very sparsely as they were accustomed to from their homes; from potatoes and skimmed milk which they were handed from the farm. They ate

> the potatoes and the milk for lunch and supper; at other times they ate rye bread with a little margarine without topping, they ate no meat of any kind. After 1900, they received one *krone* in daily salary outside the beet work. In the beets they were paid piecework, and they had a long working day; usually from 4 or 5 in the morning until late at night. They were very hardworking, frugal, and sturdy so when they were done with the beets in November, they could travel home with 200 or 300. It went well until the First World War, but by then many of them resided here in the country (NEU 12,280: 34).

Judging from the ethnological accounts, the housepeople lived on a different diet than the migrant labourers. Allegations that the conditions of the migrant workers were 'slave-like' abounded (Olsson and Eriksson 2002: 110–4), particularly on the large estates were dozens of Polish migrant workers worked and lived together in tight quarters.

Jens Madsen built an apartment for his three Polish girls who arrived on April 1 to work the beet fields. They were given bed sheets, potatoes, and milk. 'The rest they had to take care of themselves' for the one krone they were paid in daily wages which also had to cover the fees to the Aufseher who had recruited them (NEU 21, 681: 25).

I have no information concerning the nature of the relation between Jens Madsen and his 'beet girls'. But it seemed as though all the usual traits were brought out when these people looked at each other. What people eat and how they behave are the staples of ethnocentric encounters. In the case of Polish migrant workers in Scandinavia, however, there was another difference which always set them apart from the natives.

The Danes and the Swedes were *szkopy* in the eyes of the Poles. To them, it mattered little that this is a derogatory term for a German. It was still used long into the 20th century when the children who had been brought up and raised in Denmark by migrant workers used it to mean anyone who does not speak Polish (Nellemann 1981: 65). 'Don't speak, you are only a Lutheran', a Pole would say to a Scandinavian, highlighting the religious difference between a Protestant and a Catholic. 'Luther, Luther with the crooked teeth!' 'You Lutheran Dog!' (Nellemann 1981: 65).

With a Polish girl living in the house, a new category of female labour had been created. Her job was to weed the beet fields. According to the survey, she had been living in the parish since 1916, perhaps shifting from seasonal migration to more permanent residence when the war broke out.

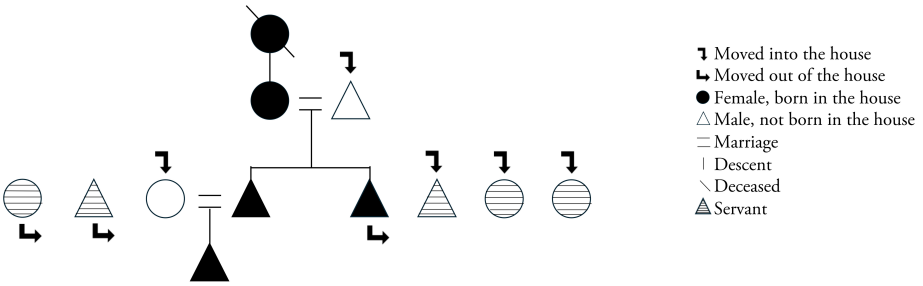

Figure 20. Kinship chart of the residents of Jens Madsen's childhood farm between 1890 and 1921 (LUF M 28569). Drawn by the author.

As each generation passed through the phases of life, there was a continual movement of people into and out of the house. In 1921, there were two married couples in the house listed equally as 'house father and farmer' for the old man and his grown son, and 'house mother' for the old woman and her daughter-in-law. Centred around the Christian marriage, there could be two married couples if they were from different generations, but not from the same. In practice, there was considerable room for negotiating which of the spouses had the upper hand in different matters, as the following story illustrates.

> A man from Western Jutland told how he one day, after his wedding was visited by a couple of horse-traders. When they had seen the animals that were for sale, he asked the salesmen if they would like a bite of bread and something to drink. They got it, but once they were gone, the man was lectured that he could invite people inside, but whether or not they were to be fed was entirely up to her, his wife (Højrup 1966: 12).

The ethnologist Ole Højrup then adds his interpretation:

> She was drawing the line between the scope of the peasant woman and the husband which existed invisibly and was necessary in operations as versatile as that of the old-time farmstead. Her particular area was the main house, the room of the poultry, and sometimes also the pigsty and the cowshed, and her direct subjects were the maids. Only when these were in the field did they, formally, enter the command of the man, and it had, usually, already been discussed on beforehand in the darkness of the alcove or the canopy bed (1966: 12).

If the basic picture is that inside is the female sphere and outside the male sphere, as seems to have been demonstrated ethnographically across the world, we are dealing with a picture with considerable room for negotiation, adaptation, and transformation (Bourdieu 1977: 89–91). Many ecological considerations made other gendered divisions of labour necessary (cf. Löfgren 1980).

But one almost universal feature of pre-fossil agriculture seemed to be a certain coordination of the activities of the genders. Writing about a very different context (Amazonia), the anthropologist Janet Siskind long ago formulated it as clearly as anyone. 'Agriculture', she wrote, 'like fishing, demands a synchronisation of the work of men and women. In addition, agricultural work is an investment of time and effort' (1975: 116–7). From this perspective, the landscape emerged as the result of the dead labour of former cultivators. Consequently, 'a man will not work hard for two months clearing land without the security of knowing that women will harvest and prepare the food'. As such both Scandinavian plough agriculture and Amazonian horticulture put different demands on people than does hunting. 'The sexual incentive for hunting is logical', Siskind went on, referring to the ritual and sexualised pressure on men by women to bring home meat, 'since hunting is a brief but recurring task as sex is a brief but recurring need' (1975: 117). Agriculture, on the contrary, is a process which stretches out in time, demanding careful observation daily for an entire season before the result can be reaped. 'The ease with which marriages are established and broken at Marcos', her Amazonian field site, 'fits well with the basic hunting economy, but a more stable relationship is essential for the responsibilities of agriculture' (1975: 117).

Nothing suggests that a farm would pass exclusively from a father to a son, although there may have been a certain patrilineal preference in many cases (Erixon 1921; Hanssen 1979). In many cases across the plains, for example when no marriageable son was at hand, daughters would step in as the heirs. That, however, does not seem to have fundamentally altered the division of labour and authority (Liljewall et al. 2001). No matter whether the farm passed through the male or the female line, marriage was a necessary step to repopulate its rooms as each generation left them vacant due to old age. After marriage, the allegiance of both spouses lay with the farm and no longer with ancestral houses. In a landscape where the population rose and foreigners arrived alongside goods, machines, new fuels and ideologies, the parental generation of the farms had good reason to ensure as best they could that the house was placed in the custody of the right son- or daughter-in-law.

A woman by the name of Marie born on the Danish plains in 1884 wrote to the folklife archive that 'Earlier, it was the custom that parents with marriable children arranged feasts or social gatherings for young people they thought could have a suitable party for their children' (NEU 14,983: 3). These youthful events were only for the children of medium-sized farmsteads (*gårdmandsbørn*). 'Rank and position were maintained strictly', she continued.

It happened that the young found love at these events where food and coffee were served. It must be remembered, Marie (NEU 14,983: 3) wrote, 'that love is a year-round instinct in the human which cannot be contained'. Saturday night was the girls' free time. Sneaking in and out of the farmsteads, the boys paid visits to the girls, but they always tried to keep their affairs hidden for as long as possible. If the flirtation was mutual, later, the approval of the parents was necessary. 'The proposer come to the girl's parents to ask for her hand but in that case, it was with the approval of the girl' (NEU 14,983: 5). If he had not obtained her acceptance in advance, perhaps sending a middleman would be a more cautious move. In any case, 'a poor girl who wants to work is worth more than a rich girl who only dresses up' (NEU 14,983: 2).

By the time Marie married at the age of 22 in 1906, the metabolism of the peasant house had already been fossilised in important ways, although the plough in the field was still drawn by a horse that ate from the meadows, pastures, and other marginal parts of the landscape. In 1959, the ethnologist Ole Højrup (1959: 67–70) summed up some practical reasons why female work was fundamentally reorganised when 'new cultural elements' arrived. Based on recent accounts collected by the National Museum in Copenhagen, his argument went as follows.

In the old (non-fossil) times, agricultural work fluctuated in intensity between summer and winter, sowing and harvest. Women weren't just hanging around during the idle season: They were busy cultivating, preparing, and spinning linen and wool. From the end of September to March 12th (the day of Gregorius which marked the beginning of the ploughing season), the girls at a house (servants and daughters) were obliged to work with these two clothing materials every night for the 'house mother'. On Saturday night, they could mend their own clothes. All work was forbidden on Sunday. 'That a young girl should sit and read a book—even if it was the Bible—was unthinkable for the old ones in the 1870s' (Højrup 1959: 68). It was not until machines for carting and spinning, mechanical looms and sewing machines arrived that the old wintertime was freed up for other use than making and maintaining clothes for the people of the house. This equipment was the true measure of the wealth of the house; something which also helped

'secure the children a safe future through an economically good marriage', Højrup said (1959: 69).

Even before any coal or oil was burnt on the farms, commodities produced by fossil capital in Manchester did transform gender relations on the farm. The shift from a subsistence economy to a market-based one did free up the hands of generations of women from textile work for the house, but it also tied the farm to the principle of exchangeability. With this change, growing up on a family farm was no longer enough education (Højrup 1966: 268). The women learned new skills as traditionally female tasks—baking bread, brewing beer, producing textiles—were taken over by factories with their smoking chimneys. This process was accompanied by a shift of the gendered division of labour on the farms: New machines meant that more work—the harvest of hay in the meadows and grains in the fields, and later milking machines—became increasingly masculinised. As Ole Højrup (1966: 270) put it, 'The first of the new machines is the wheeled hay rake which often took the place of festively dressed girls with rakes on meadows and fields'.

The proper use of excrements

On the southside of the farm, just outside where the horses, cows, and farmhands lived, was the heap. More than a metre tall, the pile measured 15 metres in length and 12 metres in breadth. It was placed in a depression on a slope. 'On the heap', Jens Madsen remembered,

> all fertiliser from the stables, all leftovers from the threshing floor, barns, courtyard, living rooms, including ashes, hen house, closets as well as waste from the garden and so on. As mentioned before, it was only the manure from the sheep shed and the geese patch that was driven directly to the fallow field (NEU 14,438: 25).

As the source of fertility, it was a highly valued and carefully distributed across the fallow land in a six-year cycle.

'When it came to cleanliness', he went on, the children were only allowed to 'relieve themselves' on the night potty or on the closet. Elsewhere in Scandinavia, the heap would also do (cf. Frykman and Löfgren 1987: 197). On Jens Madsen's farm in Lolland, 'Adults could also "relieve" in other places, for example on the heap or on the field where there was shelter' (NEU 14,438: 14). But they also had a closet of their own located at the opposite end of the house than the women's. 'The retreat of the menfolk', as Jens Madsen poetically put it, measured

> 1-by-2 *alen* (two feet), earth floor, wooden ceiling, whitewashed walls, wooden box with a seat and a round lid, beneath a square wooden box with sledge runners under, an iron ring mounted to the side with a rope attached to it; there was a square opening in the wall to this box with a hatch (NEU 14,438: 23).

As mentioned, this box of excrement would be emptied on the heap too. The women's closet was similar, only a little bigger (two-by-two *alen*) and equipped with a:

> a little window and a tared barn door, a whitewashed wooden box with a round hole and a loose lid; under the box was placed a smaller wooden box with a sledge runner beneath it and an iron ring with a short rope so you could pull it out through a white hatch to the garden (NEU 14,438: 13).

Although such privies did exist and were very much used, countless urban visitors were shocked to learn about the peasants' free attitude towards fluids and substances leaving the body. 'As late as the summer of 1918', one of the great collectors of Swedish folklore, the schoolteacher Levi Johansson, had a surprising encounter with the old peasant hygiene. 'On the farm where I stayed', he remembered:

> I happened to surprise the daughter of the house, a lass of seventeen or eighteen, on her hunkers on the edge of the stoop, from which the heap had recently been carted away. The girl did not seem in the least put out. She got up calmy, wiped herself in exactly the same way as the old lady in Frostviken (who, after urinating, wiped herself with her dress), and went into the house. It was not without some hesitation that I followed her in, since I was afraid that the girl would be embarrassed by my presence, but her expression showed not the slightest sign of anything of the sort (Quoted in Frykman and Löfgren 1987: 197–8).

To the bourgeois eye, the openness with which peasants revealed their metabolic relations with the landscape was disgusting, if not inhumane.[17] But it was not as

[17] In an influential work, ethnologists Frykman and Löfgren (1987: 197) analyses the fieldworking Levi Johansson's text as stamped as much by bourgeois ideology as by ethnological method. The

if the peasants at the time did not possess shame. They were, for example, very shy about nudity, preferring to bath in the cowshed away from others. 'Total nudity was in fact considered particularly shameful', wrote the ethnologist Jonas Frykman (and Löfgren 1987: 193), the leading Scandinavian authority on body fluids and the history of dirt, and quoted the above-mentioned bourgeois traveller. 'Not even husband and wife appeared naked before one another'.

Certainly, rural toilets could not be used by cultivated people.

'It was only during the nineteenth century', Frykman (and Löfgren 1987: 199) added, 'that it became common for farms to have special houses or separate rooms with the sole function of affording privacy to people discharging their natural needs'. The arrival of the privy on the medium-sized farmsteads 'reflects changes in the structure of village life and family relations', he went on.

> The novelty was first adopted in the better-off homes, in precisely those homes where people were becoming careful in drawing the boundaries between themselves and their animals and between household members of different ranks. When farm owners developed into masters instead of workings sharing the collective tasks, when the servants could no longer dine at the same table as the master and mistress, and when the common sleeping area was replaced by separate bedrooms, then it was essential that bodily functions become a private matter (Frykman and Löfgren 1987: 199–201).

It would be easy to assume that what happened was that they left their ancient peasant ways and transformed themselves into modern people, following capitalistic motives. Surely, on a surface level, the material culture of the peasants did begin to look like that of the urban bourgeoisie. Tapestry, private bedrooms, education outside the farmstead were elements attesting to the refinement of the peasants. Gone were the days when menstrual blood ran freely (Malmberg 1991: 61). The ethnologist Jan Garnert (1993: 108) even made the extraordinary claim that the arrival of electric light changed peasant sexuality profoundly. Before, the children conceived during the winter months when everybody stayed in the house at night were the offspring of a marriage. With everybody crammed together, there were few chances of affairs. In summer, on the contrary, there was ample chance to jump in the hay in some faraway pasture or field. The result of this cyclical pattern, the argument goes, was that a child born in spring (nine months after the dispersed summer pattern of movement) was a child born out of wedlock.

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argument goes that it was bourgeois refinement which made it possible to see the peasants' dirt as something worth reflecting on.

Domestic hierarchies

Let us look at another survey carried out in 1921 in Denmark to see how the first wave of fossilisation changed the household composition at the farm where Jens Madsen had been born and from which he had now moved. The instructions were the same across the nation: the survey had to be carried out on February 1st. All the people were to be grouped in families (which had to be numbered) and could include retirees and lodgers, but not entire families living under the same roof. An independent household consisting of just one member would also count as a family. 'Everyone is counted at the place (house, ship) where he had the bed for the night between January 31st and February 1st without regard to where he might otherwise live' (LUF M 28569). People sleeping on the road where to be counted at the place where they appeared the day after. Absentees were noted on a separate page.

When Jens Madsen bought his own farm, the former owners continued to live there with him for some time. The wife cooked for them all. The man taught him how things had been done. Soon after, Jens Madsen even renamed the farm after the former owner and went so far as to have the new name ('Memory of Rahbek') written into the legal documents. When he was old and retired from farm work, he continued to speak of Mr. Rahbek in reverential terms, almost as if he had been adopted by the new house.

Having bought a place of his own elsewhere, it was Jens Madsen's younger brother, Steen, who took over at the ancestral farm. 20 kilometres apart, on each their own farm, they continued to share the same mode of operation. In Steen's village, a local man, Hans Larsen, had been appointed surveyor by the Parish Council. For the farm on which both brothers had been born, and where now only the younger brother remained, Hans Larsen recorded the following persons.

Lars Madsen (m, 1852), married, Nebbelunde, House father, farmer
Mette Madsen (f, 1855), married, Søllested, House mother
Steen Madsen (m, 1886), married, Søllested, House father, farmer
Anna Madsen (f, 1888), married, Skovlænge
Kamma Nielsen (f, 1888), unmarried, Holeby, servant, house assistant
Peter Hansen (m, 1890), unmarried, Græshave, servant, bachelor
Maria Woiciech (f, 1893), unmarried, Galicia, catholic, beet girl
Åge Madsen (m, 1918), unmarried, Søllested, Church of Denmark, child
(LUF M 28569)

The survey also states when people not born in the parish arrived there. Lars Madsen, who was by then 69 years old, had moved there more than forty years earlier in 1878. His daughter-in-law, Anna, moved there from a village an hour's walk to the West, after marrying Steen during the First World War in 1917. The year after they had a son to whom they gave the name Åge.

So, what are the wider gendered implications of these historical changes in the peasant house? Surely, this is a complicated matter as has been pointed out by specialists like Börje Hanssen, who wrote that 'Whether the balance of power between husband and wife was changed is difficult to establish'. Nevertheless, he proposed that until the onset of the industrial age, women's power in the house was significant. 'On the whole', Hanssen wrote,

> in the peasant society, the prestige of the mistress of the house seems to have lasted through the 18th and 19th centuries. If, however, the husband succumbed to the excessive use of home distilled spirits, which spread like an epidemic during the 18th century and partly displaced beer, the wife may have taken charge of the whole house-hold (1979: 99).

The changes in attitudes regarding fertility, fallow land, hygiene and so on around the turn of the 20th century might have something to do with the arrival of fossil fuels, which took place simultaneously. Obviously, fossil fuels per se were hardly the direct cause of new morals.

The usual accounts, however, tend to overlook the changes in the material basis of peasant society when accounting for the rise of hygiene in Scandinavia. Instead, they tend to focus on the superstructures and new discourses which doctors and bourgeois moralists help spread across a society feared to be on the brink of collapse. With cleaning up the habits and minds of the commoners, things are, the reasoning went, bound to go catastrophically wrong. But to see the changing standards of cleanliness only as a matter of discourse is to overlook the basic fact of agricultural life: Namely that all neolithic forms of life are engaged in the reorganisation of flows of energy around in a landscape. The fallow, the sun, the heap, and the plough all play their part in this ecology. Only when their ideas match up with the possibilities of the landscape do the conditions for a new style fall into place. Without fertility arriving to the fields seemingly from nowhere, I doubt that the new etiquette could have caught on so quickly and so profoundly. Without the fossilisation of agricultural fertility, the value of excrement—human and otherwise—and of fallow would have been too great for the peasant to push it away and pretend it does not exist.

This vulgar example points, in my view, to how the value of land changed versus that of labour. At each turn, fossilisation decreases the value of much labour. Even in cases where it meant more work, fossilisation served primarily to ensure that the labour force had no kinship links in the community. The fossil mode of operation was, above all, a question of rendering things exchangeable: labour, fertility, mood, tools, anything should be a commodity not only in principle, but also in practice. To transport people and things around, to expand the market seemed to be what fossilisation brought about for Scandinavian peasants.

It also shows us how morality has an ecological basis.

If the arrival of coal-fuelled energy was, at first, not exactly a labour-saving technology, then it did, very consistently, come to mean that much of the labour needed for new tasks like weeding the beet fields could be sourced from where it was cheap and from people unlikely to engage in sabotage. The dependency of labour from *elsewhere* meant that the value of people could remain low. Around the sugar beet, many elements familiar from West Indian sugar plantations came to Scandinavia: managerial knowledge, uprooted labour, subsumption of the field under the factory, and evaluation of land according to its value on the world market. Some tasks, for instance spinning, weaving and churning butter, were taken out of the female realm. Tied to a steam engine, these tasks became symbolically masculine as they were endowed with exchange value. On the contrary, the foreign workers who arrived on steamships and trains to thin the beets were also female, yet they had no kinship relations to the fields they cleaned. By redrawing the line between masculine and feminine work, the peasants managed to entrench the sacred power of their 'houses' in a landscape where almost everything became interchangeable.

As hierarchies grew, so did the passion for setting apart people of different kinds (cf. Christiansen 1978). It was not, however, only distinctions of race and class that separated a peasant nobility from the 'commoners'. Due to the indivisibility of the house, its own children would, in many cases, find themselves excluded from the form of life of their parents and siblings.

Such circumstances gave people a very real incentive to close ranks. This would explain the otherwise strange fact that Lolland, while in dire need of labour power to work the beet fields at the turn of the 20th century—a problem which it solved by importing workers—was also the part of Denmark which witnessed the most intense emigration. No other part of the kingdom saw such great parts of its population—around 40 per cent of the grown population—leave the landscape exactly at the time when hands were needed the most. The lesson I drew from this

was that there was no room for those with kinship links, but plenty of room for strangers in a weak bargaining position or willing to work for lower salaries. The peasant 'houses' made exclusive demands on the loyalty of its own heirs, while excluding other children from its domain.

It had been a time-tested strategy for people in power to give out land to calm down political tensions. The line of reasoning went like this. People who have been driven off the land to work for others are likely to be subject to political radicalisation and to demand redistribution of goods if not the destruction of the social system to build a new, more egalitarian one. If, however, people are given just a little land, these concerns will be tempered by more private passions of making the most of what one has. Whenever socialism seemed to threaten the status quo, the creation of a crofter class of small holders out of formerly proletarian peoples was a political aim (Solvang 1985: 72–75).

The success of the strategy, as seen from the top of the social hierarchy, depended on striking a balance between giving people enough land to cool their revolutionary passions but little enough that they could not live off it and therefore had to turn to part-time wage labour to make ends meet. From the employer's point of view, small holders had the advantage of having developed a particular work ethic: Be responsible, thorough, and show your solidarity with the production process, not with the other workers!

From the perspective of organised labour, such crofter attitudes illustrated the petty-bourgeois resistance against coordinated strike action. With rising tensions from the First World War, much land was redistributed in the Scandinavian countries. On Højbygaard where the first steam plough had arrived, some hundred hectares was divided up into 40 crofter plots as part of the great land reforms in Denmark of 1919. All entailed estates were forced by law to hand over a third of their land to the state, for which they were duly compensated.

Before the 1950s, even the smallest farm in Scandinavia would have to take care of both plants and animals. Wheat, rye, clover, sugar beets, pigs, cows, and horses were lifeforms which mutually presupposed each other in *kobbelbrug*. Like most peasants of his generation, Jens Madsen lived his entire life in that mode of operation. He ploughed his thirty hectares from the time he took it over in 1907 through two world wars until sometime in the 1950s. Then in his seventies, he leased out the farm to his daughter and her husband (NEU 21,681: 48). They also took over four horses and twelve cows, selling off the remaining animals.

It was a few years after this that he began writing accounts of how things were done in the old days and sending them to Ole Højrup at the National Museum. The first ones were about servants, baking, wool, and care of the animals. For each

of his testimonies, he received a letter of thanks and sometimes a copy of the Museum's annual publication. The questionnaires of 1958 dealt with betrothal and marriage, tools for the harvest of hay and grains, threshing. The layout of the farmstead and its mode of operation was the subject of the coming year. In 1960, Jens Madsen responded to questions about transportation, hunting, gathering of eggs and other things, and thatching. Five years into the cooperation, the museum also began sending him some money as a thanks. Højrup sent him 20 kroner in September 1961 and 30 kroner in June of the following year. Madsen was becoming a super-informant, providing information also on issues like going to church, death and burial, slaughter, beds and sleeping customs.

Yet, Højrup and the ethnologists at the museum were not comfortable with these cash payments. The problem was not that they found it unethical to pay their informants. With prices on the rise, the fee paid by the museum 'was soon entirely symbolic, but then there is, at least, no reason to worry that the messengers, in order to make money, have written more than could be justified' (Højrup 1963: 90). For a time, the amount given was so small that Ole Højrup and his colleagues feared it would be taken as an insult.

Still, they continued their payments to the best informants, reasoning that it would still be seen as a token of appreciation and, working the power of the gift, oblige the messengers to continue responding to the questionnaires.

Jens Madsen kept going into his eighties. Højrup sent him 21 kroner for his reply on water supplies; 38 kroner for his second and more elaborated memories of animal care; 35 kroner for his 35 pages about topping-out ceremonies. In 1964, he called the museum saying that he had time for more work. For the next five years, he wrote another five hundred pages for which he received a total of 515 kroner. It was nearing the end of June in 1969 when Ole Højrup's letter was returned to sender with the note that the addressee, 88 years old with his first-hand knowledge of a world then lost to the Great Fossilisation, had died.

5 *The second wave of fossilisation*

Studying the historical development of planetary well-being, the chemist Will Steffen and his associates were certainly surprised to learn that all measurable indicators pointed to a great increase in the pace of destruction after 1950. 'One feature stands out as remarkable', they write in a *Global Change and the Earth System. A Planet under Pressure*:

> The second half of the twentieth century is unique in the entire history of human existence on Earth. Many human activities reached take-off points sometime in the twentieth century and have accelerated sharply toward the end of the century. The last 50 years have without doubt seen the most rapid transformation of the human relationship with the natural world in the history of humankind (Steffen et al. 2004: 131).

On the side of society, population, GDP, urbanisation, use of energy, fertiliser, water, transportation of goods and people (migrant workers and tourists) all spiked in a hockey-stick curve. On the side of 'earth system trends', similarly, carbon dioxide, methane, nitrous oxide, surface temperature, ocean acidification, nitrogen spill to coastal areas, and farmland all rose similarly to the detriment of forests. In a later paper, Steffen et al. (2015) called this period for great acceleration in which social development was tied to ecological degradation at ever faster paces. 'Will the next 50 years bring the Great Decoupling or the Great Collapse?', they asked. Their answer was that by 2050, 'we'll almost certainly know the answer' (Steffen et al. 2015: 14).

The realisation that all these trends had lumped together into the timespan of a human lifespan, and that humanity, or at least some powerful subsection of it, held the future of the planet in its hands, gave rise to what the French historians Cristophe Bonneuil and Jean-Baptiste Fressoz (2016: 12–3) called 'the shock of the Anthropocene'. All this has a few implications for the present study.

Firstly, in this light, the transformations explored in Chapter 2–4 were little more than a prelude to changes that followed in the wake of the Second World War. This happens to correspond to the historical shift from coal to oil as the primary source of fossilisation, when cars and tractors replaced railroads and horses in Scandinavian agriculture.

Secondly, the contemporary landscape is itself the result of this recent history. Contrary to the changes caused by the first wave of fossilisation, those of the second wave are still living memory for some older farmers. The great acceleration, then, at the time of writing, still constitutes a time where lived experience meets the archive.

Thirdly, this also makes it possible to write a history of peasant life in the Anthropocene that focuses not only on the destructive impacts (rising level of carbon in the atmosphere, eutrophication and so on), but *also on how these changes were experienced by the farmers themselves*. As real as natural science narratives about the past 50 or 70 years witnessing 'the most rapid transformation of the human relationship with the natural world in the history of humankind' (Steffen et al. 2004: 131), such accounts easily risk amounting to a way of looking at history after the tragedy had taken place from the perspective of a satellite flying over the landscape *postmortem*. How did these transformations change social relations on the farms and in the countryside? How did the farmers think about this history? And what was the nature of this relationship between nature and culture which changed so profoundly?

Before attempting to answer these questions, however, a brief tour of the research position on this history is justified.

Perspectives on the structural development

In the literature, the history of Scandinavian farmers between 1950 and, say, 2020 is often summed up as the structural development (*strukturudviklingen*) or the structural rationalisation (*strukturrationaliseringen*). In one authoritative paper, the economist Niels Kærgård and the agro-ecologist Tommy Dalgaard summed up the main lines of development as follows.

> Around 1950, Danish agriculture was in a state of equilibrium. Livestock numbers and the use of pesticides and fertilisers were at such a level that there was a reasonable balance between production and nature. The farms were not larger than for self-ownership to function fairly smoothly. It was possible to save up for a reasonable payout on a small family farm, even if you didn't inherit one. High wages, mechanisation and the resulting larger farms have completely changed this picture. There are now obvious conflicts between production and environmental concerns, and attempts have been made to maintain the balance between animal husbandry and land availability by legislated 'harmony requirements' that dictate the maximum number of animals per hectare. At the same time, farms have become so large and expensive that it is difficult to

> reconcile with individual ownership. Agriculture has become something completely different from the 1950s. Peasant culture, popular movements and voter organisations have also almost disappeared, and the conclusion drawn in 2010 could be that the new Agricultural Act should make farming a 'completely normal' profession. This means removing harmonisation requirements, allowing companies (including limited liability companies) and external investors to own farms, lifting restrictions on the size of farms and subjecting the industry to general environmental regulation (Kærgård and Dalsgaard 2014: 26).

Similarly, the historians Iréne Flygare and Mats Isacson (2011: 214) describe Sweden, and the rest of Scandinavia, before the Second World War as 'strikingly rural' when compared with the rest of Western Europe. In 1950, there were almost two hundred thousand agricultural estates in Denmark and more than three hundred thousand in Sweden. These were, according to one estimate, distributed along the following lines:

Year 1950	Denmark	Sweden
2–10 hectares	77,990	211,000
10–20 hectares	31,400	60,400
20–30 hectares	48,000	17,500
30–50 hectares	21,900	10,900
More than 50 hectares	4,500	7,300

(Skovgaard 1951: 49).

The overall movement was in the direction of fewer, larger, more specialised and indebted farms (Flygare and Isacson 2011; Kærgaard and Dalsgaard 2014). In the Swedish case, the 'magna carta of postwar agricultural policy' meant turning away from the 1930s focus on agricultural politics as social politics. The idea of using peasant small holdings as a bulwark against socialism was given up in favour doctrines of economic development. This meant firstly to ensure that medium-size farmers followed the income development of industrial workers through state-regulated prices on agricultural produce (Flygare and Isacson 2005: 229). Secondly, efficiency was conceived by merging smaller estates into larger and more economically 'sustainable' ones. In the early years, increased production was also necessary for the domestic self-sufficiency of Sweden in the event of war.

If the first wave of fossilisation entrenched and expanded social hierarchies around coal, the second wave saw their dissolution into new flows of oil. The shift

in fuels also marked the movement of world power Westwards across the Atlantic Ocean, from Britain to the US. As the Great Acceleration began after the Second World War, fossilisation became tied to a series of American attempts to contain the sphere of influence of a Soviet empire which saw itself as the universal protector of the dispossessed. But it was not only the working classes who had already been driven off the land which found themselves caught up in rivalries between empires. The way European peasants worked the land, too, became a contentious issue, which the Americans intervened in through the Marshall Plan which, as the historian Eric Hobsbawm (1987: 288) famously put it, put an end to a form of agriculture which was still at some level grounded in the Middle Ages.

For Scandinavian farmers, nowhere was this as clear as with the arrival of tractors. In a remarkably short span of time, Massey Fergusons, Fords, and other products of American fossil capital replaced the horse as the most important source of draft power. Running on coal rather than oats, it was now no longer the large estates with their distinctively 19th-century steam ploughs which operated on ancient sunlight, so did the medium-sized farmers, and even the crofters with their few hectares of arable land.

The ethnologists Thomas Højrup and Niels Jul Nielsen (2024: 444–5) argued that what drove the expansion of American industrialism across Europe after the Second World War was not only an economic process spurred by capitalism. It was also a political process in which the United States sought to contain the Soviet sphere of influence on the Eurasian mainland. They called it the immunisation hypothesis.

To keep trade free and the market open on the Western European frontier, a whole series of instruments were put in place. Among them, historians seemed to agree, the Marshall Plan was the chief one.

It consisted of cheap loans given to war-torn Europe to rebuild and develop their countries on the condition that the money be spent on goods made by American manufacturers. Sponsored by Rockefeller (the backbone of US fossil capital), companies like Ford and Ferguson flooded the old continent with machinery which had one common feature: tractors and engines needed a lot of oil to raise the European standard of living and help defeat communism.

'For the Americans running the Marshall aid programme', the British historian Andrew Carew noted, 'the ideological content of the productivity drive was never in doubt. It was, first and last, a strategy for defeating communism and exporting the American way of life' (1987: 156). In agriculture, three demands led the efforts: the rebuilding of soil fertility lost during the war by means of artificial fertiliser, mechanisation with American-built farm tools, and an increase in

imported fodder for the livestock to break the wartime shift to subsistence economy (Knudsen 1948: 289–90). The Marshall Plan subsidies to Europe were divided between fuel (16 per cent), machinery and other vehicles (17 per cent), food, feed and fertiliser (29 per cent) and 33 per cent raw materials semifinished products (Price 1955: 89).

The results quickly congealed.

First, within a very few years, tractors universally replaced horses as the primary source of draft power. Instead of oats, farm life now ran on oil.

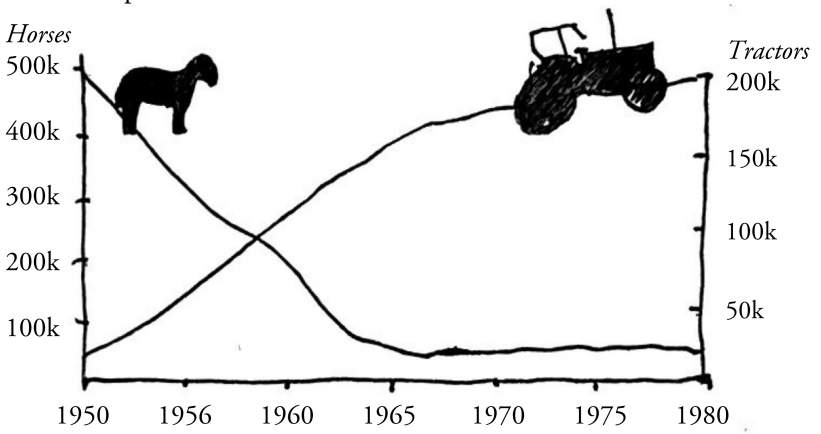

Figure 21. The development of horses and tractors in Denmark. Elaborated and redrawn by the author from Skriver (1986: 151).

Secondly, the goals of agrarian policies shifted. 'The Marshall Aid gave impetus to the systematic analysis work', wrote historian Jens Christian:

> One of the first studies from the early 1950s was, characteristically enough, about the possibilities of mechanising small farms. It was typical not only in terms of its target group—small farms—but also in its methods of analysis. The study was based partly on the farmers' own information for a labour account for the purpose of registering the total labour consumption, and partly on detailed time studies followed by cost calculations of the work areas—in this case soil treatment—that could conceivably be changed through mechanisation (1989: 134–5).

The de facto goal of earlier policies had been to maximise the productivity of the land: to get as much out of each single plot of land as possible. From the American point of view, the goal of 'rationalising' agriculture around the world was to save

labour and increase the productivity of the individual producer. In Scandinavian agricultural management and policy, this led to new analytical methods. Civil servants travelled to the US to learn about work-time studies and about machine cost calculation (Christensen 1989: 133). Now agriculture was given another political goal: to produce as much as possible with as little labour as possible.

Thirdly, to achieve these goals, new systems of cultivation were implemented and farm life was commoditised: Seeds, fertilisers, pesticides, as well as new managerial regimes entered life on the farm. All of it was financed by growing debts.

All these elements of fossilisation, then, were conceived of to tie farmers to the free market and the West and to immunise them against Soviet influence, although they were, for obvious reasons, never as much a target as the workers. 'The US funded initiatives to convert Europe's energy system from one based largely on coal to one increasingly dependent on oil' had one overarching goal, Timothy Mitchell (2013: 29) argued: 'to permanently weaken the coal miners, whose ability to interrupt the flow of energy had given organised labour the power to demand the improvements to collective life that had democratised Europe'. 'As early as the 1940s, the architects of the Marshall Plan in Washington argued for subsidising the cost of importing oil to Western Europe from the Middle East, in order to weaken coal miners and defeat the left' (Mitchell 2013: 236).

If the farmers, largely because they were property owners, were not in immediate danger of being recruited to the communist case, they nevertheless had an important role to play in the transition of social life from coal to oil.

In a world where the use of fossil energy is not measured, the natural choice is to create models and political visions that promote the productivity of labour. No matter how much a given field yielded or what kind of crops it produced, mechanisation meant increased output per invested hour of work. Until then, however, it had always been the productivity of land which was of interest to civil servants and politicians. Until fossilisation, what was interesting was which form of operation gets the most out the land, even if this meant putting more labour into it, or what kinds of people are cultivated by different systems.

It seemed as if the old colonial questions were not really as much the stuff of the past as one might think. Draft power and its fuels, fertiliser, seed and crop, all the elements were drawn from the locally anchored ones that circulate from fallow fields to arable ones, from meadow to plough, from crop to seed were replaced by wider movements of all elements of railroads, trucks, cars, and ships. With the elements of the landscape rendered abstract, the farms could now scale up beyond all the borders of the old world. It was only at this point in history that

Scandinavian family farms became small factories in line with the American picture (Fitzgerald 2003).

The recent history was, above all, one of technological development, and the way they told it to me suggested that things could not possibly have turned out differently than they did. The farmers knew all about just how technologically driven the recent development was, because they had invested in expensive machinery which continued to fascinate them. On the other hand, however, they all bemoaned the emptying of the countryside and the difficulties of handing over the farm to the next generation. In many ways, it seemed that they had reached the end of the line. I was surprised to hear how two stories—one optimistic about technological progress, the other tragic about cultural demise—would be told by the same person, often a few minutes apart, *without the teller linking them up*.

A mystery materialised.

If it was the case that peasant culture had indeed turned to a form of cannibalism where one family farm eats the other, then why would the very same people insist on treating it as a natural thing? What was it that made the last representatives of a dying breed consistently side with the forces that undermined them? Why did they see the cause of their problems also as their solution? What stood between them and the recognition that their technological victories and their kinship defeats were two sides of one and the same process?

None of the farmers I spoke to suggested to me any solution to these questions, but why would they given that they did not seem to reflect much on these contradictions. They simply lived them. Today, the farmers are very conscious of this history for they have all witnessed most of their neighbours give up farming.

Aksel, for example, who was third generation on his farm and rather well-versed in agricultural history, said that 'he had no problem saying' that a living peasant culture still existed (Interview 1).

'There are people at the universities who say that peasant culture does not really exist anymore', I said to try and press him a little on the matter, 'because you buy the seeds, you buy the energy and so on'.

'That is true enough', he replied. 'You don't produce anything. You buy what you need. I would still call it peasant culture, though, because I buy a seed and make it grow. That is what they did in the old days'. It may be, he explained, that there are breeding facilities developing new technologies 'that make me better'. 'But I still think we have a peasant culture. Just in another way. We don't wear dark clothes when we turn 65', he laughed. 'I play golf and ride a racing bicycle. So, I think we have become more like ordinary people'.

He and his colleagues had me convinced. Just the fact that there are people who are ashamed of having weeds in their fields is as good a piece of evidence as any, that we are in the presence of a culture which maintains its own ways in direct opposition to what everybody else might think. In particular, the question of the emptying of the countryside and the shaming of the farmers were objects of concern.

'When I was a child', Aksel told me,

> we were 52 children in the village. 52 children. That is a lot. There were many workers on the manor, and they had many children. Today, I think there are 52 households. We actually had three football teams. Some of them (the workers) had 8 or 9 children. And my parents had three. But many of those at the manor had a lot of children. That was fantastic. Now it is completely dead. Now there are only pensioners living there. The houses get worse and worse and their prices fall. This is happening many places out in the country. It is a consequence of. . . I have been a part of ruining it myself. I know it. Because I bought those neighbouring farms (Interview 1).

Now, Aksel cultivated as much land as one hundred people had done a hundred years ago. No wonder the countryside is empty when people are no longer needed there. But it was no longer only farmers who were buying up each other's land. Since the law on agriculture was liberalised in 2013, it has not been required to have an agricultural education or to reside on an agricultural property to own it. As a result, venture capitalists poured in. 'I think it is sad', Aksel told me speaking about a German venture capitalist who had begun buying up farms from people who 'got stuck or for whatever reason' wanted to get out.

> I am fine with the fact that there are some people who live here who get bigger. Then they live here, pay their taxes and are a part of society. But private equity funds that buy them—alright, they do have a manager on them—but next time, who is it that is going to manage it? You don't know. I have difficulties with it. I have to say it. That it is this way. The law on agriculture has been liberalised so anyone can buy land. And you don't have to live there. And the fund there, it doesn't want the building. They don't buy the buildings only the land (Interview 1).

Soon enough, the abandoned buildings would be ready to tear down. 'Then there will be no people living in the countryside. Even today, there are not so many.

The schools have closed. The assembly hall is bankrupt. It all makes my heart feel heavy' (Interview 1).

The great dehorsing

The horse was one of the most obvious victims of the second wave of fossilisation. It was also a powerful symbol of the relations between species in the old, non-fossil world (Raulff 2018: 41). By 2024, everyone still active in agriculture had been born and raised after arrival of tractors. The earlier episodes around Hagemann and the arrival of coal, sugar beets, steam ploughs, migrant labourers, and their link to the plantations overseas were, by then, no longer a part of their lived experience. But the second shift, from coal to oil, might still hold some answers to the riddle. What happened when the peasants shifted from horse to tractor in the 1950s? Why did they do it?

At the time, I figured that there still had to be some people around who remembered the dehorsing as it took place. In most places, the tractors arrived sometime in the 1950s, give or take a few years. By my calculation, farmers born in the '30s, perhaps even the '40s would be my best chance of finding living memories. The fact that they would be in their eighties, perhaps even their nineties, added further to my sense of urgency.

I asked my older informants about the 'dehorsing'. They all seemed to know exactly what I meant by the term, although I never got the impression it was one they used themselves. But when I pressed them a bit for memories about the horse, things got a bit blurry.

'Do you remember what happened to the horses after the tractors arrived? Were they kept around, were they sold or were they slaughtered?', I asked them.

'I don't really remember', answered one (Interview 5).

'They might have been slaughtered. Could you eat horse meat?', wondered another. 'I guess you could, but I don't know. They probably weren't slaughtered' (Interview 1).

It was not as if it was just too far away in time for them to remember. Some of them who had been boys when the tractors arrived vividly remembered how they loaded sugar beets onto a carriage and rode it, drawn by horses, to the factory where they would unload them again. They remembered the horses travelling the road at a time before bicycle lanes, a time with much fewer cars.

Somehow the question of what happened to the horses seemed to be a mystery even to those who seemed to remember everything that ever happened on their family farms. Strange, I thought, since everybody so clearly understands what is meant by the term 'dehorsing' (*afhestning*).

The first problem was to find informants. Everyone I spoke to, even those in their early eighties, nodded when I said I contacted them but could not answer my question: Why was it that they all, with almost no exception, took the step into fossilism with all its comforts and debts? There surely must have been some kind of reflection about this. I began to involve the farmers in my problem. They immediately seemed to get it. But they all became thoughtful and said that no one came to mind. They would have to think a little bit about it.

I began scouring the literature for accounts of the great dehorsing. I started with the paper where I discovered the term in the first place. In an interview, the retired professor of European ethnology at the University of Copenhagen by the name of Bjarne Stoklund told his own story. In the years after the Second World War when he was a student, he got a job at the National Museum of Denmark, at the ethnological division in charge of collecting the fading memories of a disappearing peasant culture. 'During quite a short while, I was sucked into a new and very exciting world'. Every summer, under the leadership of Svend Jespersen, they went out into the countryside on their bicycles. 'It was the farms just before the "dehorsing" (*afhestningen*), when much of the old agriculture was still living' (Henningsen 2002: 308).

I liked the term, finding it both poetic and precise. Stoklund had very little to say about the process of dehorsing itself. The horse had been the most important source of labour and represented one of the most intimate relations the farmers had to anything else. After all, a horse is something you must cultivate a relationship with. Unlike a car, whose mode of operation is completely abstract and impersonal, horses have personalities and a will. To get them to plough 30 hectares for you must require some serious bonding.

How could it be, then, that these relationships are so consistently forgotten that nobody could even make a qualified guess about whether they were eaten? Turning to the folklife archives, I found a few testimonies collected in the early 1990s from people who wrote about what, at the time, were recent 'peasant images' as the survey was called (LUF 21280; LUF 21281; LUF 21282; LUF 21284; LUF 21288; LUF 21292; LUF 21298; LUF 21308; LUF 21309; LUF 21320). Most of the accounts dealing with the history around and after the middle of the 20th century noted what everybody knew: The machines arrived, the women wandered off, the children lost interest in agriculture, many family farms shut down, their lands being taken over by one of the few expansionist neighbours.

The closest I came to the human side of this transformation was a few hints at the emotions raised by the new world. 'When I married in 1956', a Swedish woman remembered,

> my parents-in-law had a little farm, here in Ingelstorp. There were two or three horses on the farm then. My father-in-law ran the farm, had cows, chickens and pigs, and meanwhile, he took care of the daily transport of the milk for all the farmers to the dairy, which gave him an extra income. My mother-in-law took care of the milking, the pigs, and the hens, and helped with the beets and such. When we took over the farm after my father-in-law's death, the horses were sold, and a tractor was bought. My husband tilled the soil alongside his job, and he only had bulls for rearing and then pigs, of course (LUF 21320: 1).

Another woman, also from Sweden, explained that she and her husband took over his parents' farm in 1951. At that time, the husband had been working on the farm for some time, receiving barely enough wages. But then he bought the farm at a lower price, something which his siblings never liked although they accepted it. 'After a while, we let go of the hens and moved the pigs into the hen house. Earlier, there had been three work horses on the farm', she (LUF 21325: 2) remembered, 'but the year before we married, a Ferguson tractor had been born'.

'My husband who cared for and drove the horses, grieved them personally, particularly the last one, but was happy about the tractorisation'. But, as the historian Irene Flygare (1999: 266) pointed out, the arrival of the iron horse which only ate fossil fuels did not lead immediately to shorter working days. As one informant told her about the shift from horse to tractor, 'I guess you stressed more afterwards when it became increasingly mechanical'. 'When it became *easier*, then began the stress' (Flygare 1999: 266).

To understand what the disappearance of the horse meant, we must understand what the horse meant before it disappeared. Even as an ethnologist, one might, of course, study the horse in many ways. One could take a symbolic approach and say that 'natural species are chosen (as symbols) not because they are "good to eat" but because they are "good to think with"', as Lévi-Strauss (1964 [1962]: 89) said. Along these lines, the ethnologist Brita Egardt (1962) studied what at first appeared to be a global taboo against killing or eating horses in traditional cultures. Upon thorough comparative analysis, however, she found that the taboo had less to do with the way the animal was treated in traditional culture and more to do with the rise of hierarchies and novel forms of social exclusion associated with *those who did the dirty work*. 'The reason for refraining from killing and skinning horses', Egardt (1962: 287) concluded, was 'that people did not want to make themselves out to be rascals (*rackare*) and be treated as such', that is, as a person without honour. For this reason, the taboo emerged strongest in those

regions where social hierarchies were most entrenched in the first place, like the plains where sugar beet would later be grown.

But the reason why ethnographic attention has recently shifted back to animals and other species seems to be a bit different. Whereas the older ethnographers studied animals because they were important in people's lives, it seems that current approaches are informed by a sense of crisis: We study animals because they are marginalised, oppressed and, in many cases, on the brink of extinction (Kulick 2021: 3). Here, too, animals are good to think with, but the point is also, as Donna Haraway reminds us in case we should have forgotten, that animals can be 'good to live with' (Kirksey and Helmreich 2010: 552).

In this chapter, I will analyse some of the relations into which the horse entered in Scandinavian agriculture before it was replaced by the tractor. These relations are worth exploring because they extend all the way from the fields to the house where they shaped and maintained a gendered division of labour. So, when the horse disappeared, so did an age-old agreement between the people. Once again, the relation to nature is always-also the relation between classes and genders.

Before the arrival of the tractor, the average Danish farm, according to one estimate, covered 15 hectares of arable land and had 2.5 horses, 15 cattle, 16 pigs and 120 hens (Kærgård and Dalgaard 2014: 9). As long as the plough was drawn by horses, the animals set the limits for the work. They needed their rest between drawing up the fallows. They needed to stop and eat. 'Today', one farmer told the historian Irene Flygare (1999: 214), 'you drive around the clock and that is just as well. No, back then, the animals had to eat, and they had to go the grass fields'.

Unlike the tractor, the work done by the horse in ploughing, riding or dragging was tied to its own metabolism. It could resist and it could get exhausted. It had to sleep and stop and eat. These boundaries became clear already in the early 19th century when steam power made it clear that there was an alternative. A mechanical engineer called M. A. Alderson, for example, wrote that,

> Animals require long and frequent periods of relaxation from fatigue, and any great accumulation of their power is not obtained without great expense and inconvenience. . . To relieve us from all this difficulties, the last century has given us the steam-engine for a resource, the power of which may be increased to infinitude: it requires little room—it may be erected in all places, and its mighty services are always at out command, whether in winter or in summer, by day or by night—it knows no intermission but what our wishes dictate. (Quoted in Auderset and Moser 2016: 149).

The tractor, then, was abstracted out of time and space. The transition from horse to tractor was also theorised by Andreas Malm (2016: 41) as the transition from *muscle energy* to *stock energy*. It meant moving away from concerns about rest, will, and resistance to a smooth, technical instrument. With the horse, on the contrary, the farmer had to cultivate personal relations. 'On a 1/8th share homestead you always had two horses. And if it was a smaller farm, it was 1 horse', an 86-year-old homesteader called Johan Gustafsson told the ethnologist Mats Rehnberg in 1943. 'They were ordinary Öland horses, small, slow horses'. Already before the onset of tractorisation, traditional horses such as the Öland horse were being replaced with new, larger and stronger races from abroad. 'Then in my childhood they started to get the English variety, light horses and a bit big' (EU 27061).

Another informant (EU 31934) remembered that 'In the past, perhaps even today, arsenic is used to improve the temper of old horses'. A horse named Lotta of the old Öland breed, born in Brunamåla in Långasjö,

> was very cranky and strange and would not let herself be shoed. Father had her in the shoe stable a few times, but then he got tired of it and let her run barefoot. Lotta had such strong, hard hooves that it neither hurt her nor did it wear down hooves too much, so it went well (EU 34524).

In terms of energy, ploughing with a horse creates local flows of energy. Grass, oats, and other plants which grew in and around the fields became fodder for the animal which then ploughed the land and provided manure. The horse, then, formed a metabolic link between the fallow land and other marginal soils and the arable land. This had been the case for centuries. Many other relations pivoted around the horse, but it took its disappearance to see them.

But the nature of these personal relations with the horse also played a role in retroactively blurring the memory of the horse itself, because it seems that saying goodbye to the horse, particularly the last one, was a painful process for the older farmers. Many of them left the farm on the day when it was taken away or killed and few liked to talk about it afterwards. The personal relations which any farmer had to cultivate with the animal were so deep, it seems, that no one liked to talk much about them afterwards.

In 1945, there were more than 600,000 horses in Sweden, but then their numbers shrank at an unprecedented pace. By 1948, there were 500,000 and then 400,000 in 1951. 300,000 in 1955 became 200,000 in 1960 and 110,000 in 1965. The all-time low was reached in 1970 when only 85,000 were left. After

that, the numbers rose quickly again, but this time the horse had become a recreational animal, cherished for the relations you need to cultivate with it.

During the winter of 1995, a local archive in the sugar districts called together a group of farmers and their wives to talk about how agriculture had changed in their lifetime. Over the course of several sessions, many themes were covered, and the conversations were recorded and later transcribed, under the title 'Memory workshop: agriculture'. It read almost like a farmer's version of Plato's symposium, the topic being tractors, not love. It brings out the fascination of the new technologies well.

> Emil: 'In 1942–32 I got an old, used tractor. It was with iron wheels. If I took it as it was, I could get it cheap. We drove that one for some years. Then I bought a brand new Claas after the war. It came in a box and had to be assembled out in Nakskov. They said we could assemble it in a week if I showed up to help them. So, I saved a lot of money by doing that. It was a very fine tractor. Late in the 1940s, I bought a Ferguson. It was difficult to get. I was number 78 on the waiting list—but then suddenly, they called and said I could get it'.
>
> Jørgen: 'At first, it didn't replace the horses, that was later. We needed some time: to buy the tools, to refurnish others (they had to be bigger for the tractor). All in all, I have had three Fergusons, but we wore them out (*sled dem op*). But we also worked for others.
>
> Hans: 'I won't start with the first tractor I bought. I want to start with the first tractor I encountered. It was an old Fordson on iron wheels which gave us much pleasure. It went faster than two horses and it was amazing with a two-furrowed plough. A little experience: I was ploughing down by my neighbour. He also had an old tractor on iron wheels which his son was driving and ploughing with. They were fuelled with gasoline back then. It was after closing time and it was almost dark, but the weather was good, so we kept going. Then he ran out of gasoline, or so he thought, so he unscrewed the lid, lit a match to see how much gasoline was left in the tank. There went his hair and his eyebrows. But he is still alive and well (Fieldnotes).

From the beginning, as these men were aware, the tractor had a certain masculine aura around it. In this regard, field work in agriculture followed a pattern which closely stuck to industrialisation in many respects. Many lines of work, when mechanised, were lifted out of the skilled hands of women and into a technical space dominated by men and their technical and scientific knowledge about

machines and chemical processes. Time and again, this has been demonstrated to be the case within the Scandinavian dairy industry (Sommestad 1992), beer brewing, bread baking and textile production (Zenius 1982: 14; see also Chapter 4).

Assembling machinery, wearing it down and the fire hazard of gasoline were tied to the first tractors. Also, the increase in draft power posed a potential health risk:

> Peter: 'When I, for example, drove beets out of the field—this was when you were young and fiery and not afraid of your health—then I placed the haul underneath the seat, then it could pull as much as you liked'.
>
> Hans: 'Yes, but you risked your life'.
>
> Peter: 'Yes, we know'.
>
> Jørgen: 'We didn't like this' (Fieldnotes).

But having learned to manage these hazards, farm life soon changed fundamentally. Striking a balance between the virtues of the old frugal ways and the potentials of the new world was something every farmer needed to do:

> Peter: 'I used that one for several of the horse tools. After that, I only bought used tractors because I rented out my land and joined the labour market in 1972. But the little Fergusons which came out in 1949—there are many of them—they are still going, and I have Engineer Nielsen's word that you simply cannot break them. "I have met this gentleman (the tractor) before", he looked at it, he praised it.
>
> Hans: 'It was a whole revolution when they came'.
>
> Emil: 'It went like a sewing machine. First time I saw one people said "that is not what we want. It is just a sewing machine"'.
>
> Hans: 'It was phenomenal. It was the first which came with a lift. It was sensational and then the other manufacturers had to do the same'.
>
> Peter: 'At my place it stood in a shed. It cost 6,000 kroner in 1950, it was 8 years old, but it wasn't worn down because a tractor was spared back then'.
>
> Hans: 'Now (1995) they happily pay a quarter of a million for a tractor. That is a difference. If grains, pork, milk and the like had risen similarly, it wouldn't matter'.
>
> Jørgen: 'I have worn out, I think, nine tractors. I always bought them too small. They always had to be bigger. It was mainly me who drove the tractor, but they were also used by the farmhands. They learned quickly. So did the

children. When I bought the first tractor, I sold two horses. In a few years the last two horses went too' (Fieldnotes).

Whereas small and not particularly strong horses were often valued for generations, tractors would quickly become 'too small'. Only a few years down the line, a farmer would have to buy a new and larger tractor. A big investment, the farmer-owner prided themselves in driving the tractors, but in the early years his wife might also help.

Jenny: 'As a farmer wife, I have driven a lot of tractors. I harrowed and drove the forage harvester when we pulled up the beets. This was in the later years around 1960. Then we had no young man anymore, so I kept on going until the kids were big enough to take over. I was a bit nervous with the last big harrow we had. It was as if it might flip over when I turned'.

Hans: 'In those years it was common for the wives to be out when you had several tractors'.

Karl: 'The children also drove when they were 10 or 12'.

Jenny: 'There were many ladies who drove beets to Nakskov. I haven't tried that, but I did drive grains. I didn't have much practice, but people were kind to help me'.

Peter: 'Lars Christensen's wife drove to the breweries in Copenhagen after mash, she left home at two o'clock in the morning'.

Emil: 'Yes, sometimes twice a week. Åge Karlsen's wife drove beets to Nakskov for many years'.

Hans: 'I once spoke with him by the smith. He said, "it is too bad having two tractors but only one wife"'

From one perspective, then, the tractors were a way of intensifying farm production. They demanded a trusted person to drive them, but they also saved labour. While at first opening new activities for women, children and men, in many cases it did not take long before the tractors had caused much of the farm work to become 'lonely work', as one Swedish informant put it (LUF 21291: 2). For many observers, including esteemed ethnographers like Pierre Bourdieu (cf. Jenkins 2010: 140), this was the beginning of the end for the old peasant culture.

But whether one sees a peasant culture in decline or one in transformation, in all accounts consulted—emic or etic, academic or 'indigenous'—the energy basis—oil—and its basic characteristics are invisible. People remembered tractors, fertilisers, people coming and going—and only the oil itself in cases like the one

above when young men had to learn not to burn themselves. It is only very recently, with rising awareness of climate change, that things are beginning to change, although, for many, the fossil substratum of lived history remains tangential to older narratives of what peasant life is—and has been.

A bundle of scalability

For sugar beet cultivators, the decades that followed the Second World War entailed some profound changes in almost all aspects of farm life. Of particular importance was manipulation of the seed itself. No matter how much the beet had been refined throughout the ages, it remained a multi-germinating seed. For industrial scale production, this posed a problem that was solved by singling out only one germ for survival, while the rest were removed by hand or hoe (Biancardi et al. 2012: 86). This workload came on top of the need to weed manually before the onset of *chemistry*.

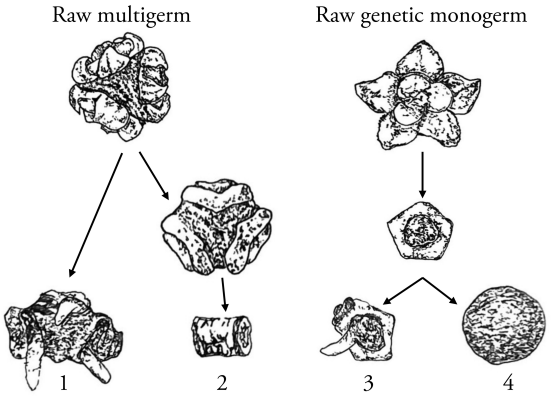

Figure 22. Multigerm (left) and monogerm seeds (left). Beets, like its wild ancestors, are multigerm seeds which create several plants from one seed, as seen in (1). Because of this, a great deal of labour was required to single out all but one plant to make the crop economically viable. Several solutions have been proposed to solve this labour problem. First, the multigerm might be polished mechanically (2), but this reduces its ability to germinate. Later, with genetically modified seeds, a monogerm could be achieved either directly (3) or pelleted (4). Redrawn by the author from Biancardi et al. (2012: 56).

Paradoxically enough, however, Jakob claimed that this whole technological development had resulted in more weeds in the fields than before. His line of reasoning went like this when I asked if there were many weeds in the fields before.

No, there was not. For back then, you weeded between the beets. Back then you sowed many seeds and there was more than one beet per seed back then. So, it stood like a hedge. You weeded that with the beet hoe. You chopped between them, and you thinned out. When I was a child, you weeded three times. The first time where you thinned out and set the proper distance. Second, if there were two (plants, you removed one), so there was just one in each place. Then you weeded again before harvest and chopped away all the shit. There were no weeds in the beet fields back then. There was *nothing!*

Do you think that if there was something there, people would have reacted? Or it simply didn't happen (that there were weeds)?

It didn't happen. All this work, it was not as if it was done by the farmhands on the middle-sized farms. Neither the farmhands, nor the farmer himself, nor his wife weeded the beets. It was beet people. It was the Polish and working men and women who weeded and pulled it up by hand.

You had nothing to do with it?

No, we didn't begin to weed before we got married my wife and me. Then we weeded beets to earn money for a freezer and different things, refrigerator.

Was it tough work?

It was strenuous for the back. It was up the row and down the row. We had ten acres of beets. We weeded it ourselves (Interview 5).

When he first used *chemistry* in 1956, a horse drew the sprayer on a carriage to fight the weeds. Before that, he reasoned, agriculture was almost organic.

'There was artificial fertiliser but there they didn't spray anything. I think the first time we sprayed the beets, it was in 1967', he said. 'In the beginning of the 1960s came a spraying liquid to spray on the beets for weeds. You couldn't before, so you weeded instead'.

According to him, the old farmers never believed that you could spray the beet without killing it. 'But it was not true' (Interview 5). Many things deemed impossible turned out to be not only possible, but also ordinary in a very short time.

The first pesticides were quite toxic. I don't think we knew. We did go to spraying courses to learn but I don't think we realised how toxic it was. You just sprayed. You could take off the cap, blew into it, *Phhhhuuu!* and then screw it back on again (Interview 5).

What Jakob is suggesting here is not only that there were no weeds in beet fields before the time of pesticides, and therefore nothing to be ashamed of, also that the whole landscape was one that was maintained by a hierarchical order which allocated different types of work to different people.

Weeding was the work of beet people. In the 1980s, this work had already lightened significantly. One Danish woman remembered that

> In the beginning we dug them loose, pulled them up, and put them in nice rows when the soil had been beaten of them in pairs. And then we took the beet and chopped the top off. It had to be done precisely, no top on the beet and as little beet as possible on the top. I always took part in that work, and the little children usually had to join in on the fields. Soon we got a plough—a 'beet lifter'—and then many years later, it all happened by machine power, topping, pulling and loading. We thought it was a horrible mess and the percentage of soil which the factory measured rose a lot. The sugar beets gave the good beet tops and the waste for fodder and a welcome income (Zenius 1982: 206).

On a farm of around 30 hectares, there were two farmhands. 'And it was not always that the farmer went out to do anything on farms of that size'. Perhaps, they did some handiwork in their workshop, and then, of course, they oversaw what the farmhands were doing in the field. Only in peak activity season did they help with the harvest. 'But in the daily activities, tending to the cows and so on, they kept away' (1982: 206).

One consequence of this hierarchical organisation is that newcomers had to work hard. Those who were 'serving' had one week of vacation each year, and every other Sunday was free time. That is, the serving farmhand was free when the jugs of milk returned from the dairy had been cleaned.

But, still, farmer children like Jakob and Albin wanted to get into the business.

'I think it lies buried deep in you from your family', Niels reflected. 'All my father's brothers, and they were fourteen siblings, all seven boys had something to do with agriculture. And both of my mother's brothers from a young age' (Interview 5).

'You talked about agriculture. You discussed agriculture. Prices for corn. Prices for pigs, and prices for beets'. 'Agriculture was discussed. I haven't heard anything else from when I was a child'.

His maternal grandfather was born in 1870. He harvested the grains with a scythe and threshed with a flail. 'In 1961', Jakob said,

> we got the first beet lifter, and we sat at his place, next to my parents. He said, and now I speak in dialect, 'I will tell you boy, the development I have been through, you will never see it!'
>
> I will say that had he gotten up today, then I think that the development that has happened from '61 until today is bigger.
>
> I think so (Interview 5).

It was not only a quantitative shift from extensive landscapes with fallow to intensive ones without it. It was also a qualitative shift from energy which was tied to the seasons and the days. A horse had to rest and to work, the fallow needed time. With the new elements, tractors, fertilisers, and pesticides, these relations to time and space could be suspended. It was an increasingly abstract landscape. Together these elements allowed for the individual farm to scale up its operations almost endlessly. The tractor, as Marianne Lien (2020: 42) points out, was not just capable of ploughing and pulling heavy stuff. It also embodied a 'dream of prosperity' and functioned as an 'enactment of growth' of a fossil kind, even far outside the geographies where it is likely to work.

Palle Christiansen (1982: 36) has described how the shift from a horse to a Massey Ferguson allowed farmers to plough four barrels of land per day instead of one with the horse. After the arrival of the tractor, the old system of cultivation in which the arable land was divided into six or eight different fields disappeared. What happened on the fields then was an almost exact echo of the changes that took place on manorial land in the late 1800s when coal and steam ploughs first arrived. The multifaceted and versatile mode of operation was replaced by fewer and larger fields. The nitrogen-fixating crops which also had value as fodder, like clover, disappeared, as did the last remains of fallow land on the fields of family farmers.[18] First, a crop rotation of barley, wheat and sugar beet overtook the plains (Boyhus 1976: 41). Later, when the animals had disappeared too, other industrial crops like rapeseed also found its way to the plains. It was not only the horse whose need for personal relations stood in the way of scalability. The old legal regime which protected hundreds of thousands of estates as the basis of agriculture, too, proved to be an obstacle.

[18] Interestingly, the EU has recently demanded that subsidised farmers set apart 4 per cent of their land as fallow. Contrary to the old fallow, the aim is no longer to rebuild soil fertility but to create habitats for birds and other wildlife in compliance with the so-called GAEC 8 requirement (CONCITO 2024). Some farmers in the sugar beet districts appear to have found a more economical solution: instead of setting aside their own very expensive land, they leased sandy and very cheap heathland hundreds of kilometres away and set this fallow (Fieldnotes).

Together, the tractor, the new beets, pesticides and artificial fertilisers allow the farmers to specialise production. Already in 1982, the old versatile farm—fully equipped with cows, pigs, sheep and chickens—had almost ceased to exist, at least on the plains in Denmark (Christiansen 1982: 40). 'Whereas the operational transformation at the end of the last century resulted in a significant homogeneity in the branches of operation across estates of different sizes, we have, for the last fifteen years, experienced exactly the opposite'. More specialised units of operation were the result of the fossilisation process.

> You are almost forced to specialise if you still want to be a farmer, and a husband and wife cannot overcome the versatile operation that their parents had—even with the strongly improved technology. They simply cannot afford to modernise the equipment within more than one or two branches of operation. Any farmer knows the problems with specialisation. You are more vulnerable today than before when the price of milk, for example, often could compensate for a bad period in the pig listing and so on (Christiansen 1982: 41).

Then, twenty or thirty years after the tractor had replaced the horse, something which had been unimaginable until then happened: some farms, particularly in the sugar districts, abandoned the remaining animals, dairy cows, pigs and hens, altogether.

> Plant breeding specialisation is a phenomenon which belongs particularly to the 1970s. In the beginning of the '70s when the cattle and especially pig producers felt the strong increase in the price of purchased fodder a better foundation was laid for farms that had the possibility of selling their vegetable products instead of using the fields to cultivate of crude fodder for their own livestock. The price of grain, seeds, rape, and sugar beet has, for several years, developed more favourably than the price of animal products (Christiansen 1982: 134).

Still in the 1970s, in one village in the sugar districts, 'farmers are very conscious of their ancestors and there is a strong patrilocal tendency. During the last decades wives have moved in from quite distant places, and this is considered a factor that brings in new customs', according to Börje Hanssen (1979: 115):

> In the era of automobiles, telephones and television, the former kinship contacts with brothers, sisters, cousins, and second cousins have decreased in favour of countless new relationships with the surrounding world. Most farmers now have two cars, one for the wife and the young ones. The women, who were housewives during the 1920s and 1930s, nowadays do not accept the role as farm mistress only. They tend to go into jobs as office employees or hospital attendants after their period of child-rearing. The isolated nuclear family has completely displaced the extended household, and tendencies of disintegration can be noted even within the small family.
>
> Young people do not willingly accompany their parents on a visit to relatives; they prefer their own companions. The cohesion of the family is not the same if the wife has employment outside the farm and has a car at her disposal. But the exclusive relations among the family members are intense due to the long period of child-rearing, the sharing of leisure time, and due to the fact that meals are taken without any servants.

But even in that situation, one principle seemed to prevail: 'No land is sold to people outside the extended village' (Hanssen 1979: 115).

Besides tractors, pesticides, fossil fuels, and new seeds, another element was constitutive of the bundle which allowed individual farms to be scaled up without limits. For centuries, the peasant houses of Scandinavia found themselves operated in a political landscape where rules were determined by law. Whatever the farmers did was also the concern of kings and, later, parliaments. And it seems that the law itself was long an obstacle to scalability.

The history of agricultural legislation in Scandinavia, especially when seen over the centuries, is extraordinarily complex. Within each country, several different traditions overlap and replace each other at different speeds and points in time. To make a long history (Holmström 1983: 12–4; Lundh and Olsson 2011; Hesselbjerg 1949: 473) short, the question of the size of the individual farm, as well as its possibilities for expansion, was one of intense political interest among landowners, self-owning farmers, workers, states, church, industrialists and virtually any other group in society. The extraordinary thing which began to happen around the Second World War was that a process of liberalisation of farmland began. In Sweden, the state played a very active role in decimating the number of farms. In Denmark, the legal conditions for scalability were introduced in a series of steps, first allowing the merging of farming properties from the 1960s onwards. With legal reforms were carried out in 2010 and 2014, the requirement that the landowner be in possession of an agricultural education (a so-called 'green

certificate') fell away, as did the last restrictions on the merging of farms (Højrup and Nielsen 2024: 1173).

This immense technical transform almost immediately reverberated in the gendered division of labour on the Scandinavian farms. The fossil specialisation created a situation where the old mutual dependency between men and women on the farms dissolved. The implications may well be appreciated in a panoramic view which sees agriculture as an activity that covers a wide spectrum from horticultural practices that coexist with hunting to industrial farming which coexists with wage labour. The fossilisation of agriculture, as it took place in the period after the Second World War, when a bundle of elements arrived to make the landscape scalable, seem to have taken this development to an extreme at which it begins to break down, because the bundle of scalability was a gendered one that took away the demand for synchronisation of the work of men and women. Surely, as one farmer's wife told me, she had been involved in farm work in her youth when there were still farmhands and girls around. The farm occupied a handful of people in the fields, and they had to eat four times a day. Cooking for them was a full-time job. But when the people disappeared and fossil energy took their place, this woman took a job as a secretary and continued to work outside the farm for the rest of her life. Until the arrival of the tractor, it was practically impossible for a married farm woman to have a job outside the farm. Therefore, it was, as the ethnologist Marianne Zenius (1982: 222) points out, also unthinkable.

The metabolic link which tied plants to animals, in effect, the foundation of the social relation which bound the work of women to that of men in the Scandinavian peasant houses had been broken.

Extended subsumption

A familiar children's game in Scandinavia, and presumably elsewhere, goes like this. Moving or dancing around chairs arranged in a circle, the task is to grab a seat as soon as the music stops. As there is one less chair than participants, someone loses and takes a chair away with them. The game ('Chair dance' is the literal translation of this game of 'musical chairs') ends when there is only one person seated.

As much as anything, this game captures the tremendous transformation Scandinavian peasant culture went through during the past 70 or 80 years. What were essentially agricultural nations became thoroughly detached from the landscape. To even speak of peasant culture now sounds like an anachronism pointing to a lost time. What is left are a few thousand farmers. In a report from

2017, a Danish research centre representing business-as-usual made projections leading up to the year 2025. 'After a slight braking in the period after the financial crisis', it noted, 'the structural development now continues with undiminished strength, and the estates are getting fewer, bigger, and more specialised' (SEGES 2018: 2). 'The structural development' was the standard phrase to describe the historical changes after the Second World War. 'Full-time operations will be reduced from 9,789 to 7,000. I.e. almost a third of the full-time estates will shut down within the next ten years!' (SEGES 2018: 2. Exclamation mark in original).

An average farm was projected to grow from 186 to 252 hectares by 2025. As far as I could see, there was no logical end point to this scaling up of the individual farms. 'The structural development happens partly through dynamic growth and development of existing farms with good economy', the report explained,

> and partly through the take-over of less-efficient farms by more efficient. In this light, the structural development is a natural element in the preservation of a competitive sector. The structural development is particularly driven by global competition with greater liberalisation, technologically oriented production, falling exchange rates, and pressure on the margins (SEGES 2018: 2).

By 2025, the prediction pretty much held up.

Already in the 1980s, leaders of agricultural organisations stopped talking the language of the old peasants who considered themselves bearers of a culture. Instead, these leaders spoke 'exclusively about rentability, efficiency and structural adjustment' (Christiansen 1982: 158). The sense of kinship has been replaced by a sense of rupture. 'This has led many—also many farmers—to conclude that peasant culture is dead', one ethnologist (Christiansen 1982: 158) noted more than forty years ago.

Alongside the seeming permanence of the medium-sized farm on his twenty or thirty hectares, the 20th century first saw the rise of a class of crofters who cultivated an intense mode of operation on their few hectares, and then, after a few generations, their demise. Once agricultural Scandinavia was flooded by oil in the decades after the Second World War, the thousands of small plots which had been parcelled out from manorial land to create a little habitat for a frugal form of life were bought by farmers of the expansionist kind.

According to Börje Hanssen, 'No land is sold to people outside the extended village' (1979: 115). As late as the 1970s, farmers in Österlen, Sweden, 'are very conscious of their ancestors and there is a strong patrilocal tendency. During the

past decades, wives have moved in from quite distant places, and this is considered a factor that brings in new customs'. Among these customs, Hanssen counted cars, phones, and television, in the era of which 'the former kinship contacts with brothers, sisters, cousins, and second cousins have decreased in favour of countless new relationships with the surrounding worlds' (1979: 115).

But a peasant culture does not just die. The idea that a peasant society was torn asunder and gave way to an industrial society with new goals and passions explains very little of what happened to the peasants. It is not the case that suddenly, one day they died and the next they were modern 'farmers'. Instead, the process of depeasantisation is a long one that takes place almost unnoticed. Those who lost the family farm, anyway, left the landscape silently, ashamed they had been the ones responsible for ending an ancestral form of life. 'It is a game of musical chairs', a farmer told the ethnologist Rasmus Blædel Larsen a decade ago, 'and when the music stops, I want to be seated' (2016: 90).

According to many Marxists, these changes tell a story about the conquest of the peasantry by capital (Mau 2023: 254; Malm 2016: 312–6). They understand the 'green revolution' as it is called in the global south, or the 'structural development' in the Nordic countries, as a process in which capital finally manages to overthrow the old ways by taking control over every step of the agricultural process. The seeds in the soil have been bought. Fertiliser, too, have been commodified. Industrially produced machinery has taken the place of the horse which fed on the marginal soils. Fossil fuels and scientific knowledge have replaced not just women, but also peasant culture itself. To understand this history, they turned to Marx for conceptual assistance. The whole thing, at first, looks like the final subsumption of agriculture under capital.

In his writing, Marx proposed that the historical development of capital involved two steps. Starting from a situation in which an artisan runs his own workshop, the first one entails maintaining the old ways. This means that the master and his apprentices are skilled workers who have detailed knowledge. Carving a shoe or building a boat requires long training and mastery over the materials. In short, it rests on the workers being initiated into the secrets of the trade. The first step, Marx theorised, involved a capitalist coming in to hire these skilled workers. They could no longer be masters themselves but remained in control of the work process. He called it 'formal subsumption': Capital was there, but only formally, as the owner of a way of working which still allowed employees to have the dignity and self-respect of having capable hands.

The second step was called the 'real subsumption' of labour under capital. Knowing that this self-respect might lead to demands and unionising, capitalists

seek to break down the autonomy of the workers. Above all, technologies prove useful here. If, the imaginary capitalists speculate, we can reduce the workers to an appendage of the machinery, the basis of their claims (their skills) will be undermined. They will more easily be replaced, forcing them to enter competition with each other. What Andreas Malm demonstrated so powerfully was that this real subsumption took place, above all, with fossil fuels. The power of coal, in the eyes of capital, was that it allowed for a constant relocation of production in time and space. What mattered was protecting the factory against rebellion, by moving to the place and time of least resistance. Eco-Marxists began to understand recent agricultural history in terms of real subsumption of nature under capital (Saito 2022: 31).

And to some extent, this made sense. Tractors, pesticides, fertilisers, and science were, unquestionably, tied to capitalist accumulation that now had seized control over the landscapes that constitute a habitat not just for people, but also for so many other species (Mau 2023: 254–272; Kloppenburg 1990). By doing so, capital had burnt the world.

Writing about the American case, the Marxist geneticist Richard Lewontin and the economist Jean-Pierre Berlan provided the following picture of the transition.

> In 1910 farmers gathered their own seeds from last year's crop, raised the mules and horses that provided traction power, fed them on hay and grains produced on the farm, and fertilized the fields with the manure they produced. In 1986 farmers purchase their seed from Pioneer Hybrid Seed Co., buy their 'mules' from the Ford Motor Company, the 'oats' for their 'mules' from Exon, their 'manure' from American Cyanamid, feed their hogs on concentrated grain from Central Soya, and sow their next corn crop with the help of a revolving loan from Continental Illinois Bank and Trust Co. Moreover, these purchased inputs are tightly linked to each other technically (Lewontin and Berlan 1986, quoted in Mau 2023: 260)

There was just one problem. In most cases, capital had not really assumed formal ownership over the land. It was almost as if capital had jumped over the first step (formal subsumption) and gone directly to the second (real subsumption of nature, not labour). I think that, for some of Marxists observers, the problem did not, after all, matter so much. In the end, what they were interested in was environmental and social destruction, which was clear enough. If some individual farmers still, technically, owned the land, it was objectively not so important because they were so heavily in debt that it was the bank which had de facto

ownership. Or you could argue that the peasants had become tiny capitalists, or a kind of underpaid managers working for financial capital without realising it.

As an ethnologist, however, this use of the concept of subsumption made me uneasy, not so much because it highlighted the ecological dimension of the peasant mode of production (I was all for that), but because it seemed to overlook the cultural dimensions of the peasants' lives. Something simply did not add up.

If the Scandinavian plains had been colonised by plantation-style corporations, buying and selling land to reap a quick profit, then sure enough: The concept of real subsumption was warranted. But for the most part, it remained within peasant families who now struggled to find a way to pass on their form of life to the next generation. For them, the estate was almost sacred. You were not even morally entitled to sell it, because you are merely its temporary caretaker. As you received it, so you must pass it on. Clearly, this was a morality which found itself in unfriendly territory. But it persisted despite the growing capitalisation and commodification of almost anything agricultural.

If the conventional Marxist wisdom was correct objectively, it was openly false subjectively. The farmers I talked to, anyway, claimed that peasant culture was still alive and well. They took a certain pride in calling themselves peasants, even though, or rather exactly because, the term carries derogatory connotations.

From all this, I would concede the point to the farmers and not Marx. Or, more accurately, there was a third possibility which Marx did not spell out, one that could be called 'extended subsumption'. Without seizing formal ownership, capital transformed the production process beyond its immediate control. Expanding its sphere of influence indirectly, it maintained an economic culture foreign to it, yet one that was, at least temporarily, mutually beneficial. The peasants were, in fact, subsumed under capital but only by extension, through the choices they made. At a formal level, they were still free, and this was the entire point: both sides could now, rightly, claim that the peasant was an independent producer. For capital, this brought an air of legitimacy into its agricultural endeavours. For the agriculturalists, it was exactly this freedom and independence which drove them to work one hundred hours a week with an expression of pride on their face.

Peasant theories of development

The farmers, however, did not look at things this way. Neither did they seem to consider themselves or the arrival of the tractor during the Marshall Plan as parts of a geopolitical game between empires. They also did not seem to consider the fact that 98 per cent of agricultural profits went to the industry supplying them

with fuels, seeds, fertilisers, machinery and pesticides, while they only kept 2 per cent for themselves, to be any reason to engage in class struggle.

'I have been an active farmer with my own farm (along with my husband) since April 1, 1951', a woman wrote to the Folklife Archive in Lund. 'For exactly 40 years, I was involved with milk production. I (we) did the first deliveries April 1, 1951, and the last delivery March 31, 1991' (LUF 21325: 1).

'We started with around ten milking cows, expanded over the years to around 40 and had, at the end, 35 milking cows and around 45 heifers, bulls, and calves'.

'40 years under "the white whip" undeniably gave reason for many thoughts and wonderings. 40 years without vacations, regulated off-time, no free weekends, but also 40 years of a good physique, mostly good moods, good friendship with the animal and good production results'.

'Would I like to live my life over again?'

'No thanks, I'll pass' (LUF 21325: 1).

According to many farmers, the act of cultivation—nurturing a seed into maturity—constituted the backbone of their way of life. While we agreed on the basic facts (many of which, like when the fallow was abandoned, they were kind enough to teach me), we interpreted this history in radically different ways. I saw it as a tragedy for a peasant culture in the process of cannibalising itself, they saw it as a viable mode of adaptation to a harsh world. If they went bankrupt, it was just too bad. It was the individual's responsibility.

In this regard, my judgment would be softer. Often, I would ask a question about a problem which I thought was a structural one only to receive an answer which was not really an answer. Or so I thought. Later when I returned to these recorded conversations, I realised that what happened was that I thought about these issues in structural terms. 'You have heard this concept before', one farmer asked me. 'A "gatherer" and a "spreader". We have had that in agriculture, right?' (Interview 1).

He continued: 'Before with the large estate where the King owned everything, and the manors, and then you made parcels for small-scale farmers'. Maybe, one day, he speculated, things would go the other way again. Already now, there was one partnership which operated 4,000 hectares together. 'And it is hefty logistics to get it to work. Huge machines and terribly dependent on people who can do stuff'.

'You had this great image of gatherers and spreaders', I said. 'Have you seen anything going in the opposite direction. Modern crofters or something like that?'

'No, what happens typically is that when an estate is traded where the land is spread out, then a farmer who lives here buys it. It is typically those that live right next door who buy them,' he said and continued.

'So, the land is gathered in bigger and bigger units, but you don't have the long transportation. Because that is really troublesome. We have fifteen kilometres to the estate down there'.

'It is easier if it is together. And I think it will be because it costs a lot of money. It costs money to drive a tractor' (Interview 1).

It was clear that they were playing a sort of existential game of musical chairs in the landscape, but they had not exactly chosen the rules themselves. It had been imposed upon them not only by fossil capital, but also by the state which created new legislation. For centuries, for example, the number of estates was fixed by law in Denmark. No one could demolish a farmstead and transfer its land to somebody else. Suddenly, in the 1960s, this commandment was relaxed.

Then, in the 2010s, a series of other regulations fell away. You no longer had to have an agricultural education to own land (a so-called 'green certificate'), nor did you need to live on the farm. Why did they not see this?

When the farmers spoke of 'spreaders' and 'gatherers' in landed property, I interpreted this as movements of scaling up versus parcelling out. In the first case, land would be divided up into a larger number of units. In the second, they came together in one unit. Or so I thought. Listening again to what he had said, I realised that the reason I at first did not understand their answer was that they were cases of individual experience, not structural development.

A spreader, in the eyes of the farmers, was just what happened when your own land happened to be spread out across the landscape. A gatherer would have it all together, making transport much easier. It was not, as I initially thought, a question of how much land an individual farmer had but how it was placed.

Out of this misunderstanding, I later came to an important insight. It is not the case that structural analysis is wrong because it does not correspond to the world view of the informants. In fact, quite the contrary, it is important exactly because it says something slightly different. It operates at another level. What I was aiming at was how the land was distributed among farmers. How many farmers were to share the land? Were they organised as crofters or manors? Although the answer started dealing with this, it quickly became an explanation of the individual experiences of having one's land together around the house or spread out across the landscape. What tied the structural and the individual together was the existence of money.

This, clearly, said something significant about how the farmers viewed what had happened to them and to the landscape. Rather than seeing it as a history of subsumption (formal, real, or extended), they saw the development as the result of an endless series of exchanges by formally equally parts.

'It is difficult with agriculture', another told me in his living room where his longcase clock was ticking away while his labrador cuddled the ethnologist. He was in his eighties and still ploughing the lands of the farm just as his father had been before him. 'As soon as you get older, then you see more problems. I guess it comes with age. I won't say that I am a pessimist, but it was easier before' (Interview 3).

'Do you think we will have to go back to a situation like the one before?'

'Yes, we were probably more. . . No, I won't say we were happier, but there were more people to do the job'.

'Why do you think it took that turn?', I asked.

'It is Euros and Cents (*Kroner og ører*). Don't you think?' (Interview 3).

I mumbled some vague version of 'I guess so' back. From one perspective, he was certainly right. The life of the farmers was subjected to the market. The bank had taken control of the family farm and controlled the access in and out of it.

How, then, does somebody become a farmer? What is the way into this way of life? Sometime earlier, I had asked another farmer how I could become a farmer, provided of course I had the skills (which I clearly did not have). 'How would I start?', I asked.

His answer said it all. Like a fetishism, the result of their own collective actions throughout the generations came back to the farmers in an objectified form, as a natural feature of the world itself. Development ran its course independently of what they might do and think. In the meantime, more fertiliser, more chemistry, and bigger machinery. How would one become a farmer in this landscape?

'You can't', he replied.

'It can't be done' (Interview 1).

Debt

For Scandinavian family farmers, the results of the fossilisation process concerned kinship relations as much as it did technology and economy. In fact, the attitudes of the farmers seemed to be following two divergent values. In their daily life and world view, continuity and expansionism formed a contradiction which was not easily solved. The fact that the farmers were caught between two opposing forces had direct practical implications. For just as all of them knew they would not and could not be farmers without kinship relations through which a landed estate was

transferred to them, they also knew that these relations, which should be maintained, actually could not. This living contradiction, then, informed their view of what history is. On the one hand, as we have seen, they subscribed to a rather merchant-like view of history. The market was felt to be a natural force to which they had to respond as best they could. On the other, my impression from talking to them about the history of tractors, weed shame, fertilisers, migrant labour and so on was that, for them, history was remembered through these kinship relations themselves. Among scholars of the European family farm, it is not uncommon to find the viewpoint that transference of the estate to the next generation is the most important passion (Flygare 2001: 13; Gasson and Errington 1993).

The anthropologist Peter Gow, who worked in Amazonia, concluded that, for the Piro people and other indigenous people, 'kinship *is* history' (2001: 7. Emphasis in original). Similarly, even if history, for Scandinavian farmers, is about many things other than blood relations, this content is always narrated through how it affected their kinfolk. Kinship, in this sense, is the lens through which history is experienced. One sunny day in September, William provided me with an example of this dynamic.

When he shifted to organic farming, many of the problems of the past suddenly returned to him. The conformities provided by the bundle of scalability disappeared. Without pesticides, weeds sprung up everywhere, threatening the economy of the field as well as William's sleep. Then in his thirties, he asked his father, who was also a farmer and around sixty years old, for advice. But because his father too had grown up with the same basic system of cultivation, he knew of no other ways. So, William experimented along the way with the help of a plant breeding consultant who helped with the practicalities and emotional burdens of transitioning to organic farming. In the beginning, he bought organic fertilisers, which was very expensive, but he soon realised it would be better to reintroduce animals to the farm and use their manure. This also meant more work, and putting his wife in charge of this. The organic beets were weeded manually. First, they hired some young people locally to do the work, but they were not satisfied with the quality. Later, they decided to do what beet farmers had done for generations before them: hire migrant workers from Poland, Ukraine or the Baltic countries. But questions remained: When was the right time to thin out the beets?

This knowledge had been forgotten during the fifty years in which everyone had turned to pesticides to keep their fields clean. Until one day, William spoke to his grandfather, who was also a farmer. He still remembered that the right time

to weed out the first time was when the small plant had not one or three leaves, but exactly two.

All the farmers I spoke to, ranging from people in their thirties to those in their eighties, came from farming backgrounds. They were born into houses. According to the statistics, the average farmer was a 65-year-old man. As he was approaching retirement, the obvious question was, 'Who was going to replace him?' 'In several European countries', writes the historian of the family farm Martin Dackling (2013: 30), 'between 80 and 90 per cent of male agriculturalists are deemed to be either sons or sons-in-law of the earlier cultivators'.

William noted that,

> Land is a resource which is pressed up. No more of it will appear. There are the biogas plants, the solar panel installations. There are larger farms. There are German companies buying up. The Germans have laid a price floor. They buy for 300,000 kroner (per hectare) minimum. So, it never gets below that. So, it is difficult to get in and get something rentable out of it (Interview 4).

Land on the plains is expensive. Getting your hands on any of it was a big challenge for anyone seeking to take up farming. It was not just that prices soared to around half a million *kronor* (Swedish *kronor*, that is, almost 50,000 Euros or the average yearly income for a Swede) per hectare. Because an average farmer in Skåne cultivated around 60 hectares, the value of his land surpasses what an average wage-earner would make during a long life on the labour market. Even if this imaginary prospect farmer were then miraculously exempt from paying taxes, buying food, paying interests or spending any money otherwise, after a lifetime of work, he still would not have saved any money for the machinery he needed.

When seen from other parts of Sweden, it was indeed astronomical. The rich, clayey soils of Skåne sold for three times the national average (130,500 *kronor*) for arable land. In the far North where the short growing season of the arctic climate made field cultivation difficult, a single hectare cost just 21,400 *kronor* (Jordbruksverket 2023).

Nobody could buy a farm up front with money earned from their own labour. That left, as I saw it, four other options. The first option would be to buy a farm with land and machinery with money you have because you happened to be a millionaire. The second option was to inherit the whole thing. The third option was to marry into a family farm. The fourth was to somehow manage to take on debt equivalent to many lifetimes of work.

'The bank, of course, cares about economy', William explained, 'but they are much more interested in the ways you manage your company today rather than just looking at if you have capital to live on, rising markets and so on' (Interview 4). 'They look at where the results are coming from. We have been able to create good outcomes also with new things'. If the organic initiatives turn out to be profitable, the bank will be more positively minded to new initiatives. 'The bank is involved in all places today. But this also sharpens you' (Interview 4).

At first, it was difficult to convince the bank to give him a loan, but in the end, he succeeded by being well-prepared. Later, when it turned out that his new initiatives often proved economically profitable, the bank grew increasingly confident in the skills of this farmer.

Figure 23. View of a field of sugar beet plants in Falster, Denmark in June 2024. Planted and weeded by a robot, new forms of precision agriculture are in the rise. Powered by solar panels, farm robots allow clean, and very orderly fields, without the use of pesticides because the robot works around the clock weeding mechanically. Not everyone, however, was convinced that the result was clean enough just yet (Fieldnotes). Photograph by the author.

For most, however, the high prices prove an impenetrable barrier to becoming a farmer. One young man who worked with his father wanted to acquire more land for himself. When land comes up for sale, however, someone without relations to the area comes in and gives 400,000 for a hectare, but the young man could

maybe, just maybe, reach 300,000 if his father also collateralised for him. 'So, he is excluded from growing bigger' (Interview 3).

The prevailing opinion was that, to get into the business, that is, to acquire a farm large enough for a single man to live off, at least 20 million kroner was needed, and probably closer to twice that amount. For those who manage to raise this, even a slight increase in the interest on the loan will be felt. 'Then you just have to run quicker', as Christian said. Someone had asked him if he was sad that he only had daughters, and no sons to take over the family farm. 'No', he had said, 'I am not sad at all because I also know people who have three sons and a big farm. And they wouldn't touch it with a ten-foot pole'. About these sons who didn't want to take over, he elaborated. 'They don't want all the trouble. Well, all the paperwork we have to do' (Interview 3).

The general resentment against the farmers, too, was something which scared people away. 'I am so old that I say, "I don't care", but the young people, they take it to heart. They aren't bothered' (Interview 3).

The farmers I visited in 2024 were the heirs to long lines of succession that stretched back generations through inheritance, marriage, adoption or simple payments. But like all European peoples, they had abandoned the classificatory system of kinship in which parenthood and siblinghood are extended and adopted a strictly descriptive one. At that time, the farmers distinguished clearly between siblings and cousins. It was clear that the closer relation one was, the more solidarity one could expect.

But it was as if the house, by its own logic, broke down this system of mutual aid, as it was only one of the children of the house who could stay there. At some point, the rest of the children would have to move away from the family farm, marry into another, or find another way to make a living. Even siblinghood was not enough to become the 'father' or 'mother of the house' (to use the term adopted by the surveyors who, regularly, conducted censuses for the state long into the 20th century).

The house and the dwellings were kept as a landed estate which was the basis of their mode of life and their pride. They responded and adapted to changing economic and political circumstances. For a long time, for example, the existence of farms was established by law. You could not parcel out land into many smaller pieces, nor could you merge them into large units. All of this changed with the Danish liberalisation acts of the 1960s and 2010s (Højrup and Nielsen 1154–5).

But if the family farms were indeed 'houses', they were surely almost empty ones. Hundreds of hectares but no people around. With the wife working out 'in the society', the children off to school or moved away from home, the farmer and

his machines would be the primary representatives of the old line of peasant nobility.

But as much as this seemed to be the general reality, it also seemed clear that it had not always been so. Everybody knew that, in the old times, many people were on the farms: children, farmhands, maids, retired parents, even grown servants were there to assist the 'owners' who, surely, were a married couple, yet allowed into their lives, even dependent on all these other people under one roof. The decimation of the people of the house which followed the rise of ppms of carbon in the atmosphere might have something to do with the fossilisation process itself.

Lost children

One Swedish farmer explained that two of his daughters were doctors in larger cities and that the third daughter was not particularly interested in agriculture either. Still, the question of whether there was an heir in the pipeline occupied him. Perhaps, all hope was not out of the picture just yet. The third daughter, he said,

> She is a civil servant. But it is probably her. She studied climate science. I think she could come back.
>
> The two others, they are not coming back.
>
> She is in Stockholm. She is a Stockholmer. That is just the way it is!
>
> It is fine.
>
> The other one has a family. She is a doctor in Gothenburg. The children go to school there, so they won't move.
>
> But the youngest one, she could do it. She could move back and own the place here. But she won't run it. She won't. I think she could come back. Not that we have any plans for it. But it could happen.
>
> First, she has to work three years in the ministry. Then it could happen. She says so.
>
> Get a good CV.
>
> See if she can get out (of the ministry) and get a proper salary. Good God, they pay poorly in there.
>
> That is also why we have said that we would rather put in a young farmer here if she has to live here. But he will take care of the land, maybe for my daughter, then she will live here and have a paid job in the city so she can afford to have the estate.
>
> I spoke with my wife about it this morning. It could be delicious if Carolina would take this over. We are very fond of our children.

> Surely, I would be glad if she would continue. She is not a farmer, but she could work. And it could be that she has children. Our other daughter has three boys. Maybe one of them wants to be a farmer. I have no idea. They really like driving the tractor. Then you come and we could say, well, let's jump a generation. It could happen. I mean, some people do it. I would be happy if this farm could continue in our family (*släkt*, literally 'kin') (Interview 1).

The quote is a testament to the impossible situation of those contemporary farmers who have already scaled up considerably over the past generations. Adopting an economic strategy of expansionism to endure (see Chapter 1), speculations and dreams of continuity clash with cultural realities in which many farmers daughters had expectations other than seeking a life on a family farm where female work had already disappeared.[19] But there is also an economic paradox at stake. For having bought up many neighbouring farms at a good time and at a cheap price, this farmer was doing very well financially, and with little debt, his earnings apparently humbling well-educated civil servants. Despite his wealth, Aksel struggled to find a successor.

As women wandered off a landscape that had no symbolic place for them, the expanding houses closed ranks. A certain air of exclusivity covered the land and its property relations which towered over the people. On the sleepless land, labour became redundant and land scarce. Skill or talent was not enough to gain access to the soil. The houses recruited from their bloodlines, but even that was not enough.

As a tractor ploughed through a field and fertiliser was sprinkled on it, energy from somewhere else was appropriated to build fertility here. It put in contact the soil here and a mine somewhere else, orienting the fruits of the sleepless lands towards a market to the detriment of other modes of economic relations: immediate consumption, sharing, hierarchical redistribution, gift-giving. These began, as fossilisation unfolded, to look increasingly suspect and decreasingly realistic, although some combination of them had been much more significant until very recently in human history.

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[19] Exactly how agricultural work was divided between genders, of course, varied across geographies at different times. While the overall movement between 1945 and 2025 was towards professionalisation of agriculture in the productivist image of male farmers, in some quarters, women continue to work on farms. In particular, they seem to be working with animals (Flygare and Isacson 2011: 225). Where beet cultivation dominates the plains and animals are absent, women farmers are rare. I have never heard of one, and when I asked the beet farmers if they knew any, they seemed not to understand what I meant.

But in creating this landscape without fallow, something happened behind the back of the tractor driver: He lowered the value of labour and raised the value of land. For a while, things were fine, the fields smelled of progress, but soon enough, the problems began. Thomas Højrup argued that all of history works this way. We may believe that what drives history is the goals people set out to realise: the growing of a crop, the creation of a pipeline to achieve the green transition or whatever it may be. But the reverse often turns out to be true. 'The specific goals which guided the peasant to develop his plough were forgotten and gone, while the plough revolutionised agriculture' (Højrup 2003: 111). It is the means, not the goal, that sets history in motion. 'In other words, there are good reasons why the study of the "tool", of material culture, has shown itself to be beneficial in ethnology'. The tool, therefore, not only represents the achievements of the past, it is 'also the condition which posits the future' (Højrup 2003: 112).

Kinship theorists have used the term 'neolocal residence' to describe this pattern (Godelier 2011: 152). It means that when you grow up and settle down, you move away from your kinspeople. Residing in a new locality has all sorts of implications. For one thing, grandparents, aunts and uncles are not living together with the children as they grow up. With neolocal residence, childcare, for obvious reasons, tends to be solely the task of the parental couple and no one else. Surprisingly, however, in the great catalogue of human cultures that has been mapped out over the past 150 years, it almost never happens, except, of course, in industrialised societies where it has become the norm. Everywhere else, growing up and getting married means moving either to the husband's kin (patrilocal residence) or the bride's kin (matrilocal). Although you can easily imagine a society where everyone would move to all sorts of relatives, the only other prescriptive rule found in a classic cross-cultural sample of 250 societies was that the couple moved in with the groom's mother's brother, avunculocal residence (Murdock 1949: 17).

Of the endless theoretical possibilities, all cultures, according to George Peter Murdock, have chosen one of these five. In all cases, except neolocal residence, the result was that kinsfolk cluster together in the landscape. It was the very mundane choice, he argued, which over time had led to the formation of kinship structures behind people's backs. Over time, a pattern of residence will come to be adopted in the rules of descent and then crystallise in a kinship terminology (Murdock 1949: 221–2). At that point, the language of kinship has been naturalised to such a degree that it is human nature, not their own earlier actions, which people see in their social structure.

'Until about a hundred years ago', the anthropologist Melvin Ember pointed out in 1967, 'it was customary in most societies for a married couple to live with or adjacent to a group of the husband's or wife's kinsmen' (1967: 291). In this view, the organisation of family into nuclear families, which prevails in Scandinavia and where most of the fossil people live, is a recent historical development. In a broad comparative and historical view, one mother, one father and their children do not constitute the way most people have lived.

Was it a historical accident that fossilisation and the nuclear family emerged at the same time? Did the bourgeois family, from the onset, represent the structure of fossil relations? And if so, would true defossilisation also be the end of it? If neolocality was historically fossil fuelled, what, then, may lie beyond? How would family farms like those on the Scandinavian plains react to a situation in which people, once again, are needed?

Imre Szeman and other students of 'petro-cultures' have shown that the modern nuclear family and the infrastructure which keeps its values alive—from suburban living, reliance on cars, patterns of consumption of food from nowhere—represent, objectively and subjectively, a historically specific form of life. More accurate than the nuclear family, a metaphor taken from atomic energy, he argued that the 'petro-family' would be more correct. Fossil relations, in any case, were distinctively narrow as compared with the rich family life of non-fossil peoples.

All this, in a sense, provides a sort of answer to a question raised by the economic anthropologist Susana Narotzky (2016) a decade ago, namely: Where have all the peasants gone? For a family farm to reproduce itself as a house, neolocal residence, obviously, could not work. The whole point of maintaining the estate undivided was to attach people to it. This also certainly means having family members, particularly grandparents, around. Contrary to purely matrilineal or patrilineal systems, however, all variables are manipulated to secure the perpetuity of the house. A daughter or an adopted child might inherit the farm just as well as the son. Marriage may be used strategically to create alliances with other, distant houses, or to keep the estate close to the bloodline.

Many farmers' children are longer interested in farming and in the mythology of keeping alive the peasant house that had ploughed the same land for centuries. Instead, the young pack up their things and leave to get an education and a job elsewhere, cutting their own ties to the landscape in a search for another kind of freedom.

I wonder whether this is not putting the blame on people who had little to do with the way things happened to be arranged. The youngsters, after all, did not

choose the landscape which they grew up taking as their natural environment. This, then, was how a peasant form of life died under fossilisation: Having shifted to a mode of operation in which everything has been rendered exchangeable, the value of human labour was lowered, while the value of land was scaled up both materially and culturally. Ridden with debt, the power to take decisions was gradually transferred from the living quarters of the old ancestral farm to the meeting rooms of the banks where new directions are laid out. Running after their own machinery, which ploughed debt deeper into the sleepless land, the peasants worked endless hours to keep together an estate which they were likely to never pass on. Instead, sooner or later, through bankruptcy or retirement, the whole thing would be swallowed up by a neighbour. It was a game of musical chairs in the landscape. Each day, another house went missing. To live, you had to eat your kind.

Once you look at tools like tractors and ploughs from a longer historical perspective, the relation between means and end is turned inside out. Means become the end, and goals become the tools. From this point of view, it is as if the tool shaped our wills, formed our desires, created our habitats, and decided where we live and who to marry. It is an organ that exists outside our body; one we cannot live without. Like lungs, tools are organs on which the human metabolism relies. Running after their own emitting tools, the tools had gotten out of hands of farmers. What was gained in the short-term was lost in the long-term as each generation came of age.

Maybe, it was the house itself which, after generations of fossil expansionism, having been scaled up with debt and artificial fertiliser, had lost touch with the basis of its cultural, political, and institutional power; maybe it was the family farm itself which had forsaken its own children.

Conclusion: *The structure of fossil relations*

Through fossilisation, the old Holocene level of 260–280 parts per million (ppm) of CO_2 in the atmosphere is now already part of the planet's history. 'There are other greenhouse gases—methane, nitrous dioxide, ozone, sulphur hexafluoride', Andreas Malm points out, 'whose social histories would have to be recounted for a full picture to emerge. But it is safe to say that the burning of fossil fuels is the hard core of the problem, quantitatively dominant and qualitatively determinant' (2016: 11). In the five years it took me to write this book, the level of carbon rose from 416 to 425 ppm, a level not seen since the Pliocene (2.6–5.3 million years ago), that, is before Pleistocene Ice Ages and the evolutionary emergence of anything resembling *Homo sapiens*. From a cultural perspective, then, the Anthropocene has entailed the rise of fossil relations.

Initially, I set out to explore how fossil fuels shaped not just an agricultural landscape, but also a whole mode of life and its worldview. Departing from Scandinavian material, I proceeded genealogically, that is backwards, from contemporary tensions about a green transition that struggled to realise itself to a historical black transition, which witnessed the weaving together of fossil energy with the everyday practices of sharing, exchanging and transmitting food, labour, tools, women, land and children.

I would like to use this conclusion to return to some of the problems stated at the outset and discuss what conclusions I draw now that the empirical material has been presented, analysed and contextualised. In particular, some wider implications of the Scandinavian material are worth reflecting on. But before coming so far, allow me to briefly summarise what I consider to be the main findings of this investigation.

First, the arrival of fossil energy in Scandinavian agriculture gave birth to a landscape without fallow. The sleepless plains, then, are one side of a fossil form of life. Inspired by Åke Campbell (1936), I studied this landscape as a site of social contradictions between industrialists, farmers and migrant workers (Chapter 2). In recent decades, however, the fallow has returned to this landscape. But now nobody remembers a time when fallow land was part of the agricultural landscape as it had been for thousands of years. Or, more accurately, the farmers have been familiar with fallow land since the European Union legislated that four per cent of any European farmer's land had to lie fallow each year. When the concept of

fallow return in its EU guise, it was intended to protect bird and insect life. For farmers, the logical thing to do was to set aside land that either yielded poorly, was too far away or had a shape inappropriate for movement of large machinery. A piece of land could now lie permanently fallow. Some leased a piece of heathland in West Jutland to achieve the right percentages. The new fallow was completely outside the crop rotation. It would have been meaningless under the old fallow concept, which aimed to build fertility by letting nitrogen-fixing bacteria do their invisible work to later cultivate the soil. However, when farmers stopped waiting for fertility and switched to buying fossil fertiliser, the old fallow concept quickly slipped into oblivion.

Second, I found this landscape model, which at first seemed like a complete novelty, to have empirical and conceptual roots in overseas sugar plantations which first succeeded in subjecting an entire landscape to the rhythm of the factory (Chapter 3). What first happened in the plantation as a tragedy that returned to the Scandinavian plains almost as a farce which built on the same elements: Labour, energy and fertility were rendered abstract and exchangeable so as to scale up the landscape endlessly. When Scandinavians ate cane sugar, they were effectively appropriating land from another part of the world into their metabolism. Similarly, fossil farming rested on the appropriation of energy from somewhere else to keep the land arable. In both cases, the status quo can only be maintained through extractivism.

Third, in Scandinavia unlike in the colonies, the family farm became the most important site where agricultural fossilisation unfolded. Along with the first technical transformations brought about by railroads, steam ploughs and ships came social change. Fossilisation lifted a great deal of work out of the hands of women and some out of the hands of men, only to replace this work with commodities that travelled around the world market by burning fossil energy (Chapter 4). Sugar beet fields needed weeding, and to do the job, thousands of Polish or other migrating women were recruited to work the land. In the first wave of fossilisation, coal contributed to the entrenchment of the hierarchal peasant house. Relations of race, class, and gender shifted into the image of a technically developed metabolism.

Fourth, when oil arrived in this landscape, the horse was the first victim. Once literal horsepower had been replaced with fossil tractor power, the elements of a truly scalable peasant house fell into place. With oil, pesticides, fertilisers, new seeds and legislations, the 'structural development' had found its own ecological foundations (Chapter 5). Seen from this perspective, what happened in Scandinavia had remarkable similarities with the green revolution, which swept

across the global south, introducing the very same elements of fossil modernity to soils around the world.

Fifth, this shift in agricultural attitudes turned agricultural parents from their own children. In the great acceleration, or the great dehorsing as it has been called here, old ties of kinship are increasingly bearing the burdens of scalability. Here, too, the Scandinavian material mirrors a global process which has, aptly, been called 'the global depeasantisation' by the agrarian sociologist Farshad Araghi (1995). Over the course of these pages, I believe I have demonstrated that between fossilisation and depeasantisation, there is not only historical correlation, but also historical causation. Through fossilisation, the farmers' own children are driven off the land.

Lastly, it is in this context that I wish to place weed shame. Although the shame attached to weeds by farmers is by no means a fossil phenomenon, it nevertheless swells under fossil relations. While often understood either as a question of economy (weeds are bad for business) or prestige (weeds are bad for the farmer's image), I have argued that weed shame should also be understood as an expression of a historical relation between farmer and landscape. In a competitive landscape (Chapter 1), tidiness is not only an aesthetic issue but an existential one, not merely for the individual, but also for the peasant house which gave the farmer his means of subsistence and to which the land itself can be said to belong.

A total social fact

In its traditional significance, fossilisation is a natural process in which biological material is preserved over long periods of time, often more than 10,000 years. Palaeontology is the study of these fossil remains meant to illuminate the distant geological past. In this conventional meaning, fossilisation is rather rare: Only a tiny fragment of living organisms ends up fossilised.

Anthropologists Shove and Pantzar (2005) imported the concept to the human sciences, where they redefined it to cover a cultural process through which mundane objects lose their practical function in daily life and end up as socio-cultural fossils which may illuminate the historical past. Typewriters are now fossilised, cars are not (yet).

Contrary to these usages, I have taken fossilisation to mean something else. Still a cultural process, it has been used to designate the linking of dominant forms of human life to the burning of fossil energy. Contrary to natural fossilisation, cultural fossilisation, in this sense, is by no means rare. In fact, fossilisation is so common that it has been difficult even to see it, until rather recently. What extant forms of life today are not metabolically reliant on fossil fuels? In the introduction,

I called it a silent revolution, and we can now see it has proved to be tragically successful. But this very success prompts the question: What is fossilisation? What are the powers driving this revolution? Is it the cause whose effects we are now witnessing? What forces can stop it? Is it just one aspect of industrial society or of the movements of capitalism? What relations does it have to other modernising processes like scientification, capital accumulation, embourgeoisement, rationalisation, economisation, or the victory of progress, development and civilisation?

These are big questions that deserve their own thorough discussion elsewhere. By pushing an ethnology of fossilisation, I do not mean to say that this perspective is more true or real than those mentioned above. In my view, fossilisation is simply an analytical perspective which it is high time we apply to current and past societies. Rather than engaging in a 'the hen or the egg' type of discussion about cause and effect, I have chosen another, more dialectical, point of view.

In this study of the fossilisation of Scandinavian peasant society, I have found Marcel Mauss' (2016 [1925]) instructions very fruitful. Analysing the cultural power of gift-giving across a wide range of indigenous societies, Mauss spoke of total social facts. Like gift-giving, fossilisation has a wide-ranging character. Both seem to creep into all crevices of human existence: They are legal, economic, religious (or at least highly ideological), aesthetic, political, as well as what Mauss called morphological (2016: 193), that is, they shape society at large. Like Mauss, it has not been my desire to study fossilisation as something frozen, static, separated as myths, values or plain technology. We have been interested in how fossil fuels have come to flow through the life of Scandinavian farmers, how they have changed through it, and how they have thought about this change. 'We see numerous men, and forces in motion, adrift in their environment and in their feelings', wrote Mauss (2016: 194).

But due to the religious, or more accurately ideological or mythical, nature of fossilisation itself, we should be careful not to mistake the immediate appearance of our object with its ethnological analysis. It may well seem that fossilisation is a kind of meta-historical tractor ploughing through the 20th century (plus a few decades on both sides). It may seem as if fossil energy and the machines it fuels exercise their own power over all of us. Here, too, there is a clear parallel to Mauss. Quoting one of the most famous informants in the ethnographic record (a Maori called Tamati Ranaipiri), Mauss notes how a gift given is considered to have a soul of its own, which compels its givers and receivers to act in certain ways (2016: 70–1). The conclusion drawn by Mauss, as well as many subsequent interpreters

of this classic text (Lévi-Strauss 1987a: 48; Sahlins 1972: 149–183), is that gift-giving effectively works to create, stabilise and expand social relationships.

This points us to a crucial concern in both social anthropology and Marxist theory. For both traditions, and for Marxist ethnology in particular, the issue at stake concerns a central kind of reversal found to be operative across human cultures, namely the fact that certain social relationships are being presented either as part of the natural order, as an aspect of things themselves, or as the will of the spirits or gods. Whereas Mauss analysed the spirit inherent in the gift, Marx chose the most important type of object in capitalist society as his object of study, the commodity. And he showed that the very mundane act of buying and selling stuff is not as straightforward as it seems. What appears to be a purely objective external relation between things—15 *kronor* for a litre of gasoline, for example—is really a relationship between people (fossil capitalists, workers, managers, consumers and so on) which is stabilised in the form of a commodity, where it appears fundamentally a-social. According to Marx, this is a religious manoeuvre, which he called 'commodity fetishism' (1976 [1867]). Both commodities and gifts are objectifications of a relation.

Coal, gas and oil, similarly, do not drive history in any direction any more than commodities or gifts exercise transcendental power over people. While still in the ground, they may well be the products of natural processes. But it is only when these subterranean sources of energy are dug up, circulated and burned that they become fuels, and this is a cultural process. Because it is human action that makes them fuels and because they seem to be implicated in most aspects of social life, either directly or indirectly, we may consider cultural fossilisation to be a total social fact. Primarily an analytical perspective, an ethnology of fossilisation like the present one should be able to explain the paradox that the heating of this planet is the result of countless individual acts of burning coal, oil and gas, yet these acts present themselves as a transcendental necessity. It is probably as difficult for most people alive today to imagine life without fossil energy as it was for the Trobrianders or the Kwakiutl to imagine life without gift-giving. I would argue that any adequate cultural theory of fossilisation must account for the mechanism of mystification or fetishism which appears to flow from the energy source itself. But in the final analysis, what first appears to be our power over nature, as Andreas Malm (2016: 314) points out using a quote from C. S. Lewis, 'turns out to be a power exercised by some men over other men with Nature as its instrument'.

Malm (2016) showed how coal has proved to be a potent instrument through which capitalists gained control over workers. Mitchell (2013), in his work

Carbon Democracy, showed how this, in turn, created vulnerabilities which coal, dock and rail workers manipulated in making their claims for more egalitarian and democratic policies, something which again was countered by the rise of oil. The present ethnology of fossilisation, then, has added a new chapter to this story by analysing the special social relations which structure agricultural production. In this sector, simple commodity production and self-employment continue to dominate even after 150 years of fossilisation and partial, or extended, subsumption under capital (see Chapter 5). It was this relative autonomy in agriculture which initially motivated including kinship relations in the theories of fossilisation.

Towards a structural ethnology

I arrived at these conclusions through a genealogical method which was both contemporary-ethnographic and historical-archival. While many historians and anthropologists tend to think of the historical and the ethnographic as mutually exclusive, European ethnologists have long claimed that their discipline must do both at the same time (Svensson 2002). What I have attempted to do here, then, is to try to implement both perspectives in one and the same text. If this study has been methodological novel, its novelty may consist of attempting to realise the ambition of making the contemporary issue behind historical analysis shine not only in the introductory remarks, but also in the ethnographic analyses themselves. Thus, I have tried, in a book-length study, to follow Tine Damsholt, who argued for 'strengthening the clear present-day basis for cultural-historical analyses' (2010: 20), which I have interpreted as beginning and ending in contemporary ethnography. This is the reason why I began with the rumour of weed shame as I heard it in the 2020s, and this is the reason why I ended with the ethnography of the lost children around the same time. Between these two contemporary snapshots lie centuries of historical conditions, which sketch the contours of a peasant form of life in transformation. Furthermore, this book has attempted to work genealogically not only in its mode of presentation, but also in the subject-matter of the analysis itself.

The first hypothesis I wish to try out is to say that ethnography and history are, in fact, two sides of the same method. Ethnographic observations and interviews are different from archival records in several respects. First, ethnography generates its own empirical material. Through it, lived experience becomes empirical data for scientific work. Observing a citizens' meeting, for example, made it clear how a pipeline through the landscape provokes a series of distinct reactions. Some were outraged by it, others enthusiastic, while many farmers seemed predominantly

concerned with the practical implications for their own drainpipes. Second, as Peter Gow (2001: 22) notes, for the fieldworker, encounters such as these entail 'an extreme sensitization to the nature of their assumptions about what humans are like, as these are brought into conflict with the corresponding assumptions of the people being studied'.

The fact that many farmers are ashamed of the weeds in their fields was chosen as a point of departure for this study for this exact reason. The notion that weeds are shameful is perfectly logical, cogent, even natural to the farmers. For most people who do not practise cultivation, it is a bit strange. Particularly in a time when everybody is encouraged to think in terms of sustainability and biodiversity. What could possibly be the problem with a little weed here and there? Would that not be a kind of biodiversity? And in any case, it is the sign that the fields have not been sprayed with pesticides, and could, therefore, be a sign one should be proud of. The conventional farmers, on their part, see the fields from an entirely different angle, and it is the job of ethnography to find out how and why.

These are problems which would hardly ever be recorded and stored in a form available or even imaginable to the historian who only sets out from the archive. But once these assumptions had been pointed out, the archive as well had some surprises in store for ethnography. The task then became to measure the historical depth of the current order. History is a method for asking the question: How did we get here? And even though many farmers in Scandinavia are well-versed in agricultural history, and familiar with the history of the peasant house to which they belong, the origins of their own mode of cultivation are obscure. Although they are aware that they continuously produce the cultural landscape, it still retains an air of naturalised tradition. The historical viewpoint grants us a place from which we can appreciate the current landscape in a panoramic view. Doing so made it clear that even when new pipelines were laid down in the landscape to defossilise it, it was little more than a variation on theme first played by Hagemann (as described in Chapter 2). Subjecting one landscape to another to keep the factory going was an idea which belonged exclusively to the Anthropocene.

If historical work and fieldwork can still be seen as one method despite these important differences, what, then, constitutes their unity? In this text, history and ethnography belong to the same genealogical method because they are means to achieving the same goal: to understand what it means to live among the fossil people. Instead of taking their passions and practices for granted, the task is to move to the margins, to try to find a place on the outside from which to look at them. This can be done either by moving in space (ethnography) or in time

(history), and preferably both (cf. Jönsson 2024; Mellemgaard and Olwig 2018). In the same vein, Lévi-Strauss wrote half a century earlier that,

> the famous statement by Marx, 'Men make their own history, but they do not know that they are making it', justifies, first, history and, second, anthropology. At the same time, it shows that the two approaches are inseparable (1977 [1958]: 23).

But science is not only about the collection of fact from other times and places. Starting from an empirical material, ethnographic or historical, I have worked by piling example on example of how farmers feel about weeds, how a sugar factory can change a landscape, as well as how the fossil world changed kinship and gender relations on the farms. Once a pile of empirical examples had been built, I looked between them for connections, similarities and relations. Like a palimpsest, when a landscape of sugar beet is superimposed on a landscape of sugar cane, another pattern emerges. This is neither the direct product of any single case, nor is it pure speculation. Thus, I have attempted to analyse the structure of the sleepless plains using a method which may be represented as follows.

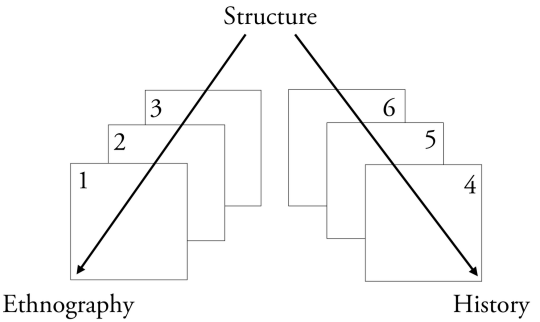

Figure 24. The structural method employed in this investigation has worked in two steps. First, empirical material concerning the fossilisation of landscapes and kinship was examined case by case, ethnographically by means of fieldwork (1, 2, 3) and historically by means of archival work (4, 5, 6). Second, by reading these cases in relation to one another, I have attempted to draw out the underlying structure of fossilisation. The model, inspired by and elaborated from Lévi-Strauss (1977 [1958]: 218), is drawn by the author.

Starting from the observation that, in agriculture, fossilisation colonised the fallow lands, the structural analysis of landscapes went on to consider a variety of different systems of cultivation: *kobbelbrug, vekselbruk,* 'the good old system' and a modernised and fossilised plantation system.

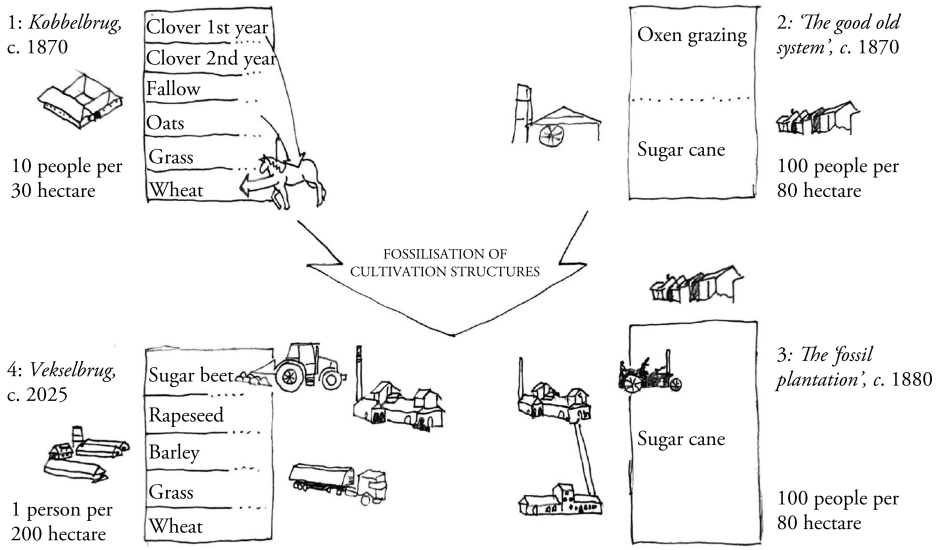

Figure 25. The four elementary structures of cultivation studied in this book as seen from the perspective of movement of energy. Contemporary intensive landscape without fallow (4: *vekselbrug*; as described in introduction, Chapter 1 and 5) are very much historical transformations of the old, pre-industrial forms of cultivation (1: *kobbelbrug*; as studied in Chapter 2 and 4) under the influence of a plantation-like blueprint (3: *the fossil plantation*; as analysed in Chapter 3) where fields are subsumed under the authority of a central factory). Whereas earlier scholars, like Ester Boserup (1965: 16), have seen such variations only as a moment in a one-directional historical sequence moving from extensive to intensive farming, I suggest we should understand them as forms of adaptation to certain historical circumstances. The shortening of the fallow, and finally its disappearance, is not a force of nature but an aspect of social contradictions materialised in the landscape structure. At the same time, low-paid labour forces were being moved around the world. A consistent feature of fossilisation across these structural transformations is the lowering of the value of labour in relation to the value of land. In the absence of artificial (in practice fossil) forms of fertilisers, soon enough practical life would instruct the farmers to return to the fallow. It would also be an immediate challenge to labour by landed wealth. Drawn by the author.

We might say that fallow land is to the sleepless land what the horse (or another draft animal) is to stock energy. A general observation which seems to be confirmed by the informants is that, *when one has grown up within a certain ecological structure, the cultural characteristics of the landscape appear to be natural.* But, as the landscape historian Bo Fritzbøger points out, 'Although the landscape

to each generation appears as a visible expression for the unaffected, "immediately given" natural basis, it has its own dynamic which, in a long-term perspective, can give comprehensive changes' (1998: 18). Today, farmers no longer have fallow land of the old type. What fallow means to them is what the European Union taught them it means when it passed a directive which required 4 per cent of farmland to lie fallow. But this fallow land is aimed at providing birds and insects with a habitat and not at ensuring that farmers have fertile soil. As such, the new EU fallow might just as well be located beyond the system of cultivation, as it often is.

This does not mean that they are the same, only that the fundamental relationships are. The plantation was extractive, effectively transporting soil fertility from the colony to the metropole. The sleepless plains, although almost all their individual elements are different—beet in place of cane, industrial relations in place of colonial relations—retain the same basic structure. The terms may be inversed, but the ecological relationship is the same. Elements are rendered abstract and exchangeable. Each year that passes by sees an enormous flow of energy into and/or out of the landscape. The plantation, as fertility rates over the centuries illustrate, were historically extracted. The soil, figuratively speaking, wandered off to Europe. On the Scandinavian plains, energy from subterranean sources were appropriated and thrown into the old soils. One is pumped, the other pumping. Of the four cultivation structures listed in the figure above, only one (Number 1, *kobbelbrug*) is not an example of what Henry Veltmeyer and Arturo Ezquerro-Cañete call 'agro-extractivism' (2023).

Working structurally might give us, by way of contrast and negation, some insights into other ways of organising the landscape, according to distinctively non-extractive ecological structures. Imagining another landscape is very much needed. Such an opening of the social imagination may find its most important expression once it is transposed to the realm of kinship structures. 'Structuralism', as Foucault writes, 'is not a new method, it is the awakened and troubled consciousness of modern thought' (1994: 208).

Fossilisation and kinship

The growing reliance on fossil fuels in Southern Scandinavian agriculture between 1880 and 2025 first built up a hierarchy in which the farmers rose above their housepeople only to render them superfluous. The house first swelled and was then hollowed out. Like a chair eaten by termites, it stands until suddenly it collapses. The changing values of the peasant house can be summed up as follows.

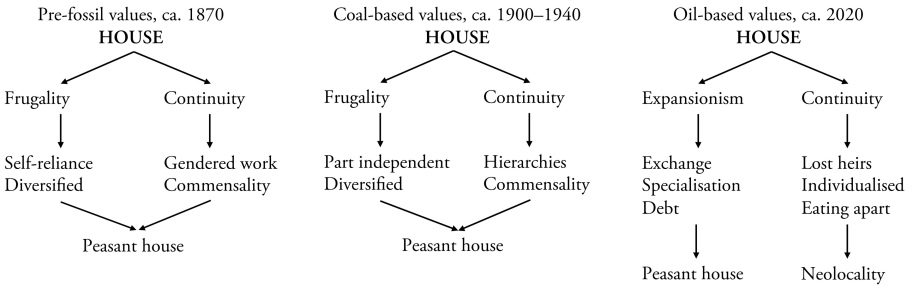

Figure 26. Three value systems of the peasant house. The values changed historically as did the mode of operation on which peasant kinship rested. This model is inferred from the material and analyses of pre-fossil values and the transition to a coal-based farm life in Chapter 2 and 4, and contemporary oil-based values and contradictions in Chapter 1 and 5. In (1) and (2), upwards of ten people lived on a farm whose lands tended to cover between 20 and 30 hectares. In (3), as it came to be developed in the 2020s, a single man tended to several hundred hectares while the wife and children tended to work outside the farm. The bottom dropped out of the house. Drawn by the author.

The values on the left represent how the peasant house produces material things, while the one to the right represents how it produces people. The two are mutually constitutive, although they are clearly contradictory to each other.[20] In their daily activities, the farmers, when speaking to each other and when working the land, continue to manifest these contradictory values of the peasant house to which they belong, a house which, in a sense, gave them both a livelihood and a culture. They project their values of continuity and expansionism onto each other, their children, and, of course, the landscape itself. By doing so, they ultimately aim to reproduce their own form of life.

The transformation of peasant houses, from those based on values like frugality and continuity, over hierarchy, to an expansionism which undermined the

[20] Much ink has been devoted to the question of the peasants' alleged frugality. Against unilinear modes of historical explanation claiming that peasant society was a frugal monolith which gradually came to be replaced by bourgeois, 'rational' logics, Christiansen (1978) argued that, even in older times, different economic strategies, and value systems if you like, coexisted within the same peasant population. This is no doubt true. The point, however, by linking cultivation structures to kinship structures, is to show that a certain frugal and versatile attitude to the environment is a prerequisite in non-fossil systems of cultivation. This is, in a sense, the basis, on top of which any conspicuous consumption (as described in Chapter 1 and 4) must stand. This should be seen in the light of the structuralist orientation of this work. Any individual farmer may, of course, have all kinds of individual passions and attitudes. What the present ethnology has ultimately aimed at, however, is not the things themselves but the relations between them (cf. Barnard 2017: 333), as they are established and transformed in history.

continuity of most houses, was a historical process which rested on a set of political decisions taken over the past 150 years. The first moment of fossilisation only came after liberal reforms instituted the free market in the second half of the 19th century. The infrastructures facilitating the colonisation of agricultural land by the factory, too, rested on political subvention and recognition, as did the movement of migrant labour across Europe. Later, agrarian policies shifted following the Marshall plan, allowing competition to take place between land-owning farmers, and the special political protection of farmers fell away only a little more than a decade ago. Throughout, the landscape was shaped politically, even when it was assumed that its character was the expression of a law of nature.

What fossilisation does, above all, is to spin individuals, households, and economies into a sphere of exchange. The first effect is to generalise, if not universalise, the commodity form. It is at the level of maintaining an infrastructure for the movement of people to work, of fuels for the machines, of food from one continent to another, and to exploit the potential exchange value of anything, that fossilisation is first felt among a people. It is now the material basis of the world market. Without a means to physically ensure the transaction, the market would be just an illusion or a dream.

For Lévi-Strauss, the value of introducing the concept of house into the 'institutional arsenal' (1990 [1979]: 173–4) of ethnology, accordingly, was to better understand the line separating elementary structures of kinship from complex ones. This understanding, in turn, rests on another idea, namely that it could or should be a task of ethnology (broadly speaking) to find a way to reduce the diversity of the world to a few meaningful structures, to find some order in seemingly arbitrary ethnographic data. Such a system of kinship structures might be organised in a series of different ways, and it seems to me that, despite continuous claims that this was the goal of his structuralism, Lévi-Strauss (1983 [1964]: 10, 1977 [1958]: 340) never explicitly put forward a model. It therefore fell on his student Maurice Godelier (2011: 87–108) to try to do so, and when he did, he chose descent as the main organising principle, in relation to which he listed six main structures.

Matriliny	Patriliny	Duolineality	Bilineality	Houses	Nuclear families

Although they are all, as Godelier (2011: 101) points out, imaginary constructs telling people to whom they belong, their consequences in the world are very real. Among many other things, for example, descent modes go some way towards

explaining who is expected to act altruistically towards whom (Godelier 2011: 119–21).

The houses marked the transition between the primitive and the fossilised, or what Lévi-Strauss called elementary and complex structures of kinship. Caught between matriliny and plantation, the house represents a form of life where the old ties of blood have not yet been severed in economic life, a form before the moment of primitive accumulation set in. According to Tiina Sylvasti (2003: 148) in Finland, 'The continuity of the family farm is the most important aim of the farmers'.

By lowering the need for labour in favour of a growing hunger for land, the fossilisation of the house, simultaneously, caused farmers to draw in their horns and protect their land against outsiders. This, in turn, created something of a paradox in their kinship relations. On the one hand, the more any individual farm is scaled up, the more important inheritance becomes. According to the farmers themselves, it has become impossible to enter agriculture without being born into a farming family (see Chapter 5). On the other hand, for most family farms, the same process leads to the dissolution of kinship ties in practical life as the children leave the landscape. Fossilisation, then, strengthens kinship for the few who manage to transfer the farm to a family member and loosens it for the many who do not.

Now, we look to history to find a way out of the tragedy we have cultivated for ourselves. Ethnography teaches us that, without cultural self-reflection and exposure to other ways of living, we are bound to project ideologies shaped by the fossil age ethnocentrically onto the green transition. Structuralism, then, offers a comparative point of view by establishing that the landscape and mode of life we take for granted is just one option among a series to which humanity has resorted. What I have been after, along with Lévi-Strauss, is some deep structure which forms a 'common patrimony' of a given culture, its history and everyday life (Quoted in Ginzburg 1991: 21). I suppose that my real object of study has been an agricultural form of life in its historical transformation under fossil relations. In his original quote, Marx went on to write that 'the tradition of all dead generations weighs like a nightmare on the brains of the living' (1907: 5). This seemed particularly appropriate as a description of fossil relations. The emissions of our ancestors weigh down on us, just as ours weigh down on our own children, in a living climatic nightmare.

Interestingly, when Lévi-Strauss tried to come up with a structural concept to replace the ethnocentric distinction between primitive and civilised societies, he chose to speak of 'cold' and 'hot societies'. Both kinds live in history, but cold

societies work, through their traditional institutions, to cancel history and create an appearance of timelessness. 'Hot societies', on the contrary, resolutely internalise history and make it 'the moving power of their development' (Lévi-Strauss 1966 [1962]: 324). The terminology seems particularly well-chosen, as the hottest societies produce heat not only symbolically (the defeat of kinship and ritual by marriage, cf. Lévi-Strauss 1983 [1964]: 328–339), but also in the literal sense. Global warming is, in fact, the product of the most civilised and the hottest societies, which are defined, according to Lévi-Strauss, by 'their generation of extreme social inequalities' (Gow 2001: 311).

This might seem a bit abstract, but it is essentially the very point made by Andreas Malm in *Fossil Capital*. The roots of global warming lie in the capacity of fossil fuels to create, maintain, and entrench social hierarchies which generate capital. As I have shown in this book, the introduction of fossil fuels into Scandinavian society was very much the history of cranking up the heat on the peasant society (already half-hierarchical and half-egalitarian) in the name of progress and development. The value of a structural theory of fossilisation lies not only in its explanatory value in the past, but also in its ability to open our imagination to different ways of thinking about defossilisation.

Contributions to the three traditions

Eco-Marxism, postcolonialism and peasant ethnology are the three main research traditions to which I wish to be accountable. What are the differences between them, and what contributions have been made to them? From one perspective, it may be easy enough to draw up a map of how they occupy different terrains, problems and epistemological interests. Eco-Marxism is an engaged science of the relations between class struggles and ecologies. Postcolonialism, too, is engaged, but frames things more in terms of race than of class and is bound empirically to the colony, while traditional Marxism takes the factory as an empirical point of departure. In contrast to these traditions, peasant ethnology might seem less polemic and political, although it was clearly always tied to nation-building processes in which states projected their imagined communities onto a primordial peasant past (Garberding 2015; Gustavsson 2014). Much important research, however, emerges at the intersection of these traditions (Højrup 1983; Mintz 1985; Narotzky 2016; Trouillot 1988; Zimmerman 2010; Jones 2025).

Malm (2016) demonstrated that the most important feature of fossil fuels, as opposed to most other kinds of energy available for human use, was abstract. It was not tied to the muscles and bodies of animals or humans which could get tired or resisted, nor was it bound to the landscape like wind and water, which have a

rhythm of their own. Fossil fuels were storable and exchangeable, and it was this quality which capitalists first used to break the solidarity of workers in the British textile industry.

In this work, I have taken some steps to complement this picture with the dynamics inherent in Scandinavian agriculture, where the wage-capital relation may not be the best way of understanding the struggles and contradictions which cut through people's everyday life. Instead, the farmers lived a distinct form of life, which is better described using the concept of simple commodity production instead of capitalism, although the history of fossil fuels has been shown to assert relations of dominance between the two economic cultures. On the independent farms, fossilisation was, at first, a process which created new relations of class and gender at the same time. Traditional female work was lifted out of the hands of women and rendered technical and masculine. Thus commodified, new boundaries were drawn between those who owned the farms (or were owned by them) and those who did not.

The contribution to Eco-Marxism, then, lies in pointing out that there are still forms of life which do not owe their entire existence to capitalism. Even in heavily fossilised areas like the Scandinavian plains, the farmers still represent something fundamentally different from wage labour or capital. Ethnography has an important role to play when the aim of critique is to be constructive. This has been the case since the days of Marx who, in his later years, became increasingly preoccupied with ethnographic input. In particular, it was Lewis Henry Morgan's invention of kinship which led him to return to the questions of gender which had occupied him in his early years. When Marx first read Morgan in the winter of 1880–81, he drew inspiration from kinship theory to solve the immediate problems of understanding the role of the peasantry in the making of a new and more just world.

> In a word, [the rural commune] finds [the modern social system] in a crisis which will end only by its elimination, by a return of modern societies to an 'archaic' type of communal property, a form in which—as an American author who is not at all suspected of revolutionary tendencies, supported in his work by the government in Washington, says—'the new system' toward which modern society tends 'will be a revival in a superior form of an archaic social type' (Quoted in Trautmann 1987: 253).

Having previously described the revolutionary potential of the peasantry using the metaphor of a sack of potatoes that could not represent themselves but had to be

represented (Marx 1907: 133), and inspired by the revolutionary spirit in Russia, Marx began to see an emancipation in the peasant household where private property had not yet taken hold of the landscape. Instead of claiming that the peasants had to be dispossessed to become revolutionary workers, he now claimed that Russian agriculturalists were in a situation much closer to the true communism that he strove for. Suddenly, as he wrote in the preface to the second Russian edition of *The Communist Manifesto*, 'Russia's peasant communal ownership may serve as a point of departure for a communist development' (Saito 2022: 195). Kinship made it possible to *see* the manifold relations of primitive people. However, once seen from this angle, their relations were no longer primitive but much more advanced than the narrow, isolating ones imposed on civilised peoples by the nuclear family. It was from the encounter with ethnography that Marx broke with his earlier 'Eurocentric conception of development' (Lindner 2022: 24). Still today, ethnography (for example of the elementary structures of cultivation and kinship) helps Marxism look beyond the horizon and appreciate what another ecology might look like (Knight 1995). It was a similar concern with cultural difference which encouraged me to propose a little theory of extended subsumption as an ethnographically driven complement to Marxist theories of formal and real subsumption of labour and nature (see Chapter 5). While this is every bit as true of postcolonialism as it is of Marxism, there is also another contribution to the former which I would like to highlight: studying a decisive moment in the history of one plantation society, namely the moment when fossil energy supplemented coerced labour.

All the major cultural processes described so far have aimed at generating the conditions in the natural and social world for what Anna Tsing called scalability. 'Scalability', she wrote, 'is not an ordinary feature of nature. Making projects scalable takes a lot of work' (2015: 38). It means being able to enlarge any institution in the landscape without questioning the basic building blocks. Tsing (2015: 39) claims that this basic structure was first invented on the sugar plantation: Workers were wrested away from their kin, and the cane itself was a clone without relations to other species in the landscape when it arrived in the new world.

When sugar beet cultivation was first taken up on Scandinavian manors, once again the same elements appeared time after time: fertilisers from nowhere, migrant labour, steam ploughs, coal and consultants. This is what I mean by a bundle of scalability. The elements bundle together into an institutional structure. On the plantations, it consisted of enslaved labour and alien crops. On the manors, the bundle was made up of migrant labour, steam ploughs and

commercial fertiliser, all of which were transported on railroads and steam ships, which also burned a lot of coal.

But until the mid-1900s, as Tsing pointed out, it took a lot of work to render things abstract in time and space, and therefore, scalable. I would argue that only with the arrival of the tractor did this change. Only after this point was it not only the already hierarchical manors which resorted to fossil ploughing, but all farmers. Only after this point, and surprisingly quickly, did the work done to render the landscape scalable become invisible. After the 1950s, exchange value and scalability became inscribed in what counts as 'nature'. Hereafter, scalability became naturalised as the order of the landscape, and the idea that one could do other things with it became increasingly obscure, even among the farmers themselves. But this bundle was always a fossilised one, and there is an argument to be made that it is this very institutional structure which is projected onto the 'green transition'.

Everywhere, it works to create abstract space and time in which all elements are exchangeable and scalable. Fossilisation works around a landscape to endow it with exchange value. This, it seems to me, is perhaps the most profound ideological implication of fossilisation. Through fossil energy, the idea that anything whatsoever can and should be marketised is rendered not just as the tradition, but also as nature itself. Until just a few hundred years ago, most aspects of human life were not commodified, if for no other reason than because it was just troublesome or even impossible to make everything an object of exchange. With the steam engine, exchange value became universal. For the fossil people, it is only natural that all elements of the landscape can be bought, sold and circulated. Seeds, crops and fertility became commodities in an ideological structure which recognises no other way than a market. Coal, gas and oil were always the material substratum of the transactional language.

In this landscape where everything seems to be for sale, peasant ethnology directs our attention to the things that aren't. Although formally private property, the family farm is, based on this definition, sacred. It should not be sold but kept apart and transferred through kinship and marriage. If it is sold to strangers, a mode of life has come to an end. These are familiar insights into the old peasant ethnology. Åke Campbell (1936) and Börje Hanssen (1977, 1979) saw the significance of kinship in agriculture and insisted on treating it as dialectically related to the conditions of existence to which the family farm adapted through history. But what they couldn't see, and what few could see before the language of the Anthropocene reopened these old cases, was that the demise of the peasantry, its technical masculinisation and its indebted expansionism, rested on

fossil energy at every turn along the way. For the old ethnologists, modernity arrived with the power of a natural force, and they looked to history to salvage information before it was too late.

The contribution of the present work to the old ethnology is to return to familiar episodes and study them through a lens informed by the perspective of the Anthropocene. It is not so much the material which is new as it is its significance. For now, the question is rather why the material basis of the new world escaped for such a long time the analysis of the ethnologists who followed the dissolution of the old peasant culture into modern life. In the fossil light, the inevitability of the transition seems much less inevitable. This holds true equally for the birth of a sleepless land as for the kinship structures that took root in it.

Regardless of whether one looked at kinship from an evolutionary or an ethnographic point of view, the nuclear family was a deviation. 'Over the past hundred years', Melvin Ember noted in the 1960s, 'there has been an increasing tendency all over the world for couples to live neolocally, that is, apart from relatives of both spouses and at a place not determined by the kin ties of either' (1967: 291). In his cross-cultural study, he pointed to the 'unfavorable man-land ratio' as a determining factor which may push people into neolocality, when the landscape contains too many people or too efficient technology. The mechanism behind the emergence of neolocal residence, he argues, is 'that commercialization increases the productivity of labor' (1967: 300). The flipside of this productivity increase is, as modern families were only too aware, that childcare has now become contained within the nuclear family with one mother and, possibly, one father, which for so many people meant too few parents.

'To the question of the impact of industry on the structure of society', the sociologist Wilbert Moore wrote long ago when people still bothered thinking about these things at all, 'at least partial answers are available. Industrialization involves urbanization in some degree and is uniformly destructive of extended kinship systems' (1966: 41). Fossilisation somehow dissolves 'binding mutual obligations among many relatives of various degrees' (Goode 1970: 41). The anthropologist Manning Nash (1967) found the same to be case for the Cantel in Guatemala, whose industrialisation he studied in *Machine Age Maya*. For better or for worse, fossil relations were loose ties. The development in Scandinavia is particularly well-suited to the study of longer historical transformations because, unlike many parts of the world traditionally studied ethnographically, due to the presence of the state there is rich source material going back at least five hundred years.

But it is not as if fossilisation is the only way to turn matrilineal relations into patrilineal or cognatic ones. This has also been achieved through ideology, ritual, or violence (Godelier 1986). But fossilisation does the same more consistently, more effortlessly, and in a more concealed manner than these other forces.[21] This means, however, turning many of 20th-century kinship studies upside down, and pointing out the metabolic relations which, at any given time, sustain the prevailing kinship system. Lévi-Strauss (1969 [1949]: 464; 1983 [1964]: 10) conceived of all kinship systems as logical/mental variations on the basic idea that kinship consisted of the exchange of women by groups of men. Instead of such idealist and sexist schemes, the idea that kinship can be fossilised returns to the materialist research agenda initiated by Morgan and Engels, but this time without the transcendental framework of unilinear development. If 20th-century critical theory had not killed off this ethnocentric evolutionism (it is still alive and kicking, of course, in mainstream economics through the focus on GDP growth), then the climate crisis and the discourse in the Anthropocene should put it to rest, as it makes it abundantly clear that any alleged 'progress' in bourgeois, evolutionist terms was always predicated on fossilisation and other forms of extractivism.[22]

Different kinship systems may form the starting points, but the result of the fossilisation process is remarkably similar across the world. 'Everywhere the ideology of the conjugal family is spreading', William Goode noted when the great acceleration was just picking up speed, 'although a majority does not accept it' (1970: 369). On the one hand, one might celebrate the loosening of ties and relations of authority between kinfolks. Goode certainly seems to be of this opinion. That, however, did not stop him from writing that 'Driven to judge, I suspect that on the average, the older family patterns did yield greater contentment to the people who lived out their lives under them, but any careful reading of the folklore and literature of those cultures reveals countless instances of extreme pain and happiness as well' (Goode 1970: 380). Seen from this perspective, the nuclear family is the most energy-demanding form of kinship known to ethnology—if not mentally for parents who stand alone with their children in their individual dwellings, separated from their kin—then at least in

[21] Arguably, there was also a good deal of moral education involved in the creation of proper nuclear families in Scandinavia throughout the 20th century (Frykman and Löfgren 1987).
[22] The economist Kate Raworth (2017: 263), in a remarkable passage, notes that upwards of 80 per cent of historical growth in GDP in key industrialised nations has been ascribed not to capital or labour but to embodied energy. Economic growth, then, has historically primarily meant burning more and more fossil fuels to facilitate the production, circulation and exchange of goods.

terms of the amount of energy harvested from subterranean sources to make an adult out of a child.

Questions without coal and oil

Even if fossilisation first took place under a ruthless factory capitalism, throughout the 20th century it swallowed up practically all political ideologies, also those which defined themselves *in opposition to capitalism*. In the Soviet Union, the early Bolshevist rule sought nature conservation. Only with the rise of the five-year plans did things change. Increasing the production of steel and coal became key policy goals of what Malm (2016a: 239) calls *fossil Stalinism*. From the first five-year plan in 1928, soviet communism had also become fossilised. As a myth, fossilisation exercised its vision of what human life is really about on most other dominant ideologies across the world. Smallholders engaged in simple commodity agricultural production also became tied up with flows of oil, tractors, artificial fertilisers, and pesticides, shaping a new vision of what the landscape and the future had to look like. The central contradiction at work might very well be that of capital accumulation, but the concept of fossilisation as a total social fact shows us that the implications reverberate across all spheres of social and natural life.

In Scandinavia, the fossilisation of peasant culture was intimately connected with fossil capital, the farmers' own movements and rising welfare states. Oil and the technologies around it came to stand for modernity, progress and the good life for those farmers who manage to adapt to the new conditions, and it was always the silent basis of Keynesian political economies (Mitchell 2013: 123–5) on which Scandinavian states framed themselves as the avant-garde of human civilisation, while effectively functioning as a bulwark against soviet communism (Højrup and Nielsen 2024: 426–9). Despite the national differences in legislation, pace and ideology, the main movement, particularly on the plains, has been in the direction of ever larger agricultural units supplying a world market. This effectively functioned as a vision, or a myth in the anthropological sense, around which most parties—farmers, their organisation, industry and the state—gathered (see Chapter 1). As of 2025, it remains the primary mode of orientation even when plans are laid for the combined crises of climate and biodiversity (2024: 1155). The solutions are conceived of within the historical framework of fossil scalability, not outside it.

This, in turn, raises the question of what the defossilisation of kinship might mean. If the nuclear family had been one historical result of the fossilisation process, what other forms of kinship might lie in store if we leave fossil energy in the ground?

At first, one might consider the green transition as a political project like any other within living memory. If we take only our own lived experience as the measure of the challenge, this is only natural. One can only compare with what one knows. But the further back in time I projected the study of fossilisation, the more epochal and far-reaching the imperative of defossilisation began to seem. When seen from the dual perspectives of landscape and kinship which have been the main analytical categories of this work, I began to doubt that the current structure, the sleepless plains and their houses without children, could survive the fossil era. Some, of course, argued that more sustainable technologies were on their way to preserve the current order without emissions. I was in no position to judge the technical viability of these projects (which to date have nevertheless failed to materialise in the form of reduced emissions). But even if it was possible, it was not clear to me why they should be desirable. Even if it was possible to stay on the current trajectory without emissions, why wouldn't it be a political goal to stop the global depeasantisation which fossilisation had started? 'It is almost as if', David Graeber noted, 'people had been led to believe that the era's technological advances and its greater overall complexity had had the effect of *reducing* our political, social, and economic possibilities, rather than expanding them' (2011: 393. Emphasis in original).

As an example of this dynamic, let me return to the citizens' meeting which opened Chapter 1. As a response to what we might call the planetary imperative of defossilisation, the sugar industry embraced the suggestion that the solution for the sugar factories was not to electrify but to build new pipelines. During the period of writing this book (2021–25), the pipeline was first conceived, then approved, its construction began, and finally, in 2025, the two Danish sugar factories in Nakskov and Nykøbing-Falster were now connected to the main gas network closer to Copenhagen where, as it happened, another pipeline carrying fossil gas from the North Sea to the European continent ran.

Thus switched to natural gas, how far have the sugar factories really come in defossilisation? The plan, of course, was for farmers to produce biogas for the pipeline, and many of them were already looking into this. If this plan is realised, the result will be that, to keep up the current trajectory, the sleepless plains will have to subject another landscape to procure its energy in the absence of fossil energy.

If this study has shown anything new, it is the extent to which pipelines per se, as an integral feature of the cultural landscape, were the means through which fossilisation first worked. Soon their function—the effortless exchangeability of energy, cane or beet juice—was accepted as natural by politicians, by farmers and

by industrialists. Yet when seen in the wider spectrum of what agriculture might constitute for its practitioners, this is indeed an oddity of a fetishist nature: The magic of the pipeline involves rendering invisible the world of social relations around it and only presenting us a technical vision. For the farmers, paradoxically, this means that the instruments of 'defossilisation' serve the trajectory of the structural development. With pipelines, the slow emptying of the countryside, the tragic game of musical chairs, can go on.

We are thus confronted with the question of what sort of historical transition defossilisation might be. Can it be conceived of as a challenge for engineers and others who envision technical solutions? Or is it an epochal transformation in which social life itself is fundamentally transformed? If the latter is the case, then we should perhaps begin to posing social questions, instead of just technical questions, to the green transition.

If fossilisation has historically meant global depeasantisation, will defossilisation also mean global repeasantisation? If ideas about the scalability and exchangeability of all elements of the landscape (fertility, draft power, labour power, seeds and crops) were all sustained by the movement and burning of fossil energy, does the green transition then also provide an opportunity to ask how one might organise a landscape? I am thinking not only in quantitative terms (that there will soon be less energy available), but also in qualitative terms: How much longer can we avoid the question of whether a true green transition will not mean a qualitative shift in the energy forms? From the abstract to the absolute, from the stock to flow? Once this possibility is recognised, a series of new questions will emerge.

Why is it that new, labour-intensive, structures of cultivation that impose a taboo on fossil energy (like small-scale, horticultural, 'regenerative' agriculture' as described by Ahl 2023; Aare et al. 2024) tend to be female dominated? And why is it that such horticultural gardens seem to be so porous around their edges that people are drawn in, in stark contrast to the exclusivity of fossilised agriculture? What kinds of kinship structures might take root if these systems of cultivation turn out to endure while their conventional neighbours go bankrupt?

Questions regarding the relationship between fossilisation and processes like nationalisation, colonisation, democracy and autocracy have already been raised by scholars like Timothy Mitchell (2013) and Fernando Coronil (1997). These are questions that now need to be considered more seriously. As such, I consider this conclusion to be not only the end of an empirical study, but also the beginning of a new conversation: What do we want land to mean in the future?

If we can accept the theory that fossilisation has historically lowered the value of labour with respect to land, and that this has led to a situation where farmers draw in their horns, then why should we seek pipelines and technologies to keep things going along their current trajectory. How many farmers would we expect to farm the plains? What relations do we want them to cultivate with each other?

As Bruno Latour points out, the *new climatic regime* (rising CO_2 levels) has led to a '*profound mutation in our relation to the world*' (2017: 8. Emphasis in original). In this vein, there are ample critiques of 'The dominant, affluent model of the "good life"' (Soper 2020), of the 'imperial mode of living' (Wissen and Brand 2021), and of modern economics (Raworth 2017). Interestingly, Donna Haraway (2016: 99–103) states that the answer to the problems of the Anthropocene might very well lie in kinship, which she redefines as relations not only between people, but also between humans and other species. Getting this multi-species genealogy to be on speaking terms with classical anthropological kinship theory seems to me to be one important avenue for future research, because 'kinship is not about to disappear, and kinship relations have not seen their last metamorphosis', as Maurice Godelier put it in his last sweeping contribution to this grand tradition:

> Both real and imaginary, abstract, sometimes even purely symbolic but always brimming with concrete interests, rooted in each of us from infancy, accept or rejected when we reach adulthood, imposed by others or chosen in the teeth of everyone, kinship relations and all of the representations (images, positive and/or negative values) that go with them would be threatened with fossilization[23] and, ultimately, disappearance, only if that which is the distinctive feature of humankind were to disappear or be destroyed, that which definitely separated humans from the other primates, their natural cousins, namely: that fact that *humans not only live in society, but can and must produce society in order to live* (2011: 553. Emphasis in original).

What kinship theory offers, then, is a language and an analysis of the forms of life which may lie beyond the social organisation under which people live in the Anthropocene. Considering that the nuclear family and fossil fuels spread at the same time, the end of the age of fossilism, what can the ethnographic record teach us about the relation? In fact, the discourse on the Anthropocene makes it clear

[23] Clearly, here Godelier uses the term fossilisation to mean the dying out and petrification of social practices (see also Shove and Pantzar 2005), and not in the sense in which it is employed in this book, as the process through which social life was tied to the digging, movement and burning of coal, gas and oil.

that we have very little choice but to consider radically different ways of organising the landscape. It will have to be a task for further research to go over the cases—of which there are many, also in the parts of Scandinavia where farms passed in matrilineal heritage (Stoklund 1985: 146).

Any discussion of how real or idealistic such *alternative arrangements of the landscapes* are comes up against another argument, one which has appeared in different guises in the present work too. Throughout agricultural history, questions of sovereignty and domination have played a great role in determining the consolidation of any given mode of operation. West Indian sugar plantations around 1800 are the prime example of the domination of cultivation by political relations. There, the colonial interests of the state cultivated the obscenest forms of neolocality (stealing people from one continent and shipping them to another) and exploitation under the threat of violence. At the same time, one section of the Scandinavian peasant class was freed from feudal domination and turned into self-owning and eventually politically powerful citizens. The logic was that a self-owning peasant has something to defend: his own land and by extension the motherland (Højrup and Nielsen 2024 416–7).

An implication of all this is that to Engels' (1972 [1884]: 71) old formulation that 'According to the materialistic conception, the determining factor in history is, in the final instance, the production and reproduction of the immediate essentials of life', we need to count not only the production of food and other goods (the cultural landscape and its mode of production) and kinship relations, but also to include sovereignty into the category of reproduction. The results of agricultural work can only be harvested at the end of the season. As a system of 'delayed return', to use James Woodburn's (1982: 432) anthropological formulation, agriculture is vulnerable over long stretches of time.

But this does not necessarily and in all circumstances lead to an escalating arms race in which kings, states, plantation owners and capitalists extract more value out of a landscape which they themselves defend. While this is obviously the case sometimes—and has been the case during in the Anthropocene where first the British and later the American empires have cultivated their visions of a good, fossilised agriculture on fields way beyond their own domains of sovereignty—it may be more the exception than the rule. To explore what fossilisation of sovereignty might mean, the dynamics of imperial collapse, and the subsequent reorganisation of landscapes and kinship systems, however, will have to be a task for further historical, ethnographic and conceptual research.[24]

[24] Scattered across the literature are any number of ethnographies, historical cases and conceptual presuppositions which, taken together, might form the starting point for such an undertaking

After fossilisation

The woodcut which is reproduced on the cover of this book expresses in colours, better than I can in words, the sensation that the sun is indeed setting over the sleepless plains. The artist Ingemann Andersen was himself born on a little farm in the sugar district, and he depicted beets and landscapes. He was, in the words of the writer Mathilde Walter Clark (2022: 50), 'the maestro of the beet', one of the few who, based on his interest in daily life, introduced the sugar beet into Western art. The sky mottled by yellow, red and blue reflections from a sun which sets behind the woods appears at the end of an anonymous field. The fields have been reaped, and it looks as if they have been recently ploughed. If the seasons mirror the daily rhythm, it must be autumn, because the sunset speaks of closings, not openings.

The fields are there, and so are the woods, but the true object of the woodcut is the sunset, for which the landscape forms the relevant context. As the art historian Tine Fabienke (2022: 87) who curated his work at the local art museum points out, Andersen did not focus on the 'despised plain landscapes' and the willows, as the view of the endless fields is obstructed by woods. The themes of long-views, obstruction of oversight, the negation of contempt of the plains which are too flat and too economical, are interwoven into work and the analysis of it.

The motif of the sunset made evident to me that an epoch was coming to an end and that among the many ecological, political and economic structures known to ethnology, new ones were waiting to be born. The woodcut echoed the old idea that 'Broad daylight is the enemy of perspective, but, between night and day, there is a moment of transition at which the architecture of the sky is as fantastic as it is ephemeral' (Lévi-Strauss 1961: 69–70). Only now when we must bring an end to our fossil relations can we see how much they shaped us. And now that a revolutionary transformation in the energy system is unavoidable, we can also begin to glimpse what other ways of living are humanly possible and planetarily necessary.

As we approach a green transition, the farmers are a reminder that there is a way of life much older and much more deeply rooted in the landscape, according to which the goal of life is neither consumption nor endless movement, but the simple fact of belonging. Still to this day, kinship is the basis of farming in Scandinavia as elsewhere, even though many manoeuvres are made to

(Douglas 1969; Goody 1976; Højrup and Nielsen 2024: Holden and Mace 2005; Campbell 1936; Graeber 2011; Mitchell 2013; Hastrup and Lien 2020; Wainwright and Mann 2018; Godelier 2011; Knight 1995; Wolf 1966; Boserup 1965; Stoklund 1985; Mann 2000; Malinowski 1929, 1965, 2005 [1922]).

accommodate the peasant house to fossil conditions. Even when women and children are expelled from the house, it retains its power over the people. In recent times, the peasant houses have been hierarchical, but earlier when labour, not land, was at a premium, more egalitarian relations filled the landscape.

But agricultural history has always been written by the winners. Those who, through whatever strategies, managed to maintain an active relation to the landscape tended to share certain experiences: If you scale up, you might make it. Those who did not soon found that they could make a living, perhaps get another job outside the farm. Then, they would have to farm during the evenings and weekends, becoming what they sometimes refer to as 'moonlight farmers' because they ploughed after sunset (Graminius and Halberg 2025). From that point, it takes little more than a bad harvest or retirement age to realise that there is no future in the business for yourself or your children. Then you sell the land to your neighbour whose father started off at the same place as your grandfather (with 30 hectares of family land), but who has already bought up one, two, or three neighbouring farms. On his expanding estate, the fields can be bigger and so can the machines. And the debts.

For every winner who is still 'in the game', there have been 20 losers since the Marshall Plan dehorsed Scandinavia. But somehow, their stories are soon forgotten. 'In the free peasant ideology, it is legitimate that the farmers eat one another', Palle Christiansen wrote in the early 1980s when these changes were first felt as structural issues, 'whereas it is considered destructive for the independence, the initiative and thereby also for the production if the state regulates the allocation of land too much' (1982: 73).

Pointing to a sort of 'survival of the fittest' mentality, Christiansen added that 'Those who are outcompeted must give up their land and thereby cease to be peasants' (1982: 73). This is not just a Scandinavian pattern. The sociologist Farshad Araghi (1995) pointed out that, in all countries, the period between 1950 and 1990 witnessed a shrinking of the part of population living from agriculture. He called the process, which as we can now see ran in tandem with the great fossilisation, global depeasantisation. Those that do remain a lifetime after the horses lost their function have good reason to attach great value to expansionism and tidiness in the field. In the world in which they have grown up, shaped as it was by imperial fossilisation and free trade, field shame is little more than the flipside of a strategy that had worked. At least, it has worked so far, for a select few. The fact that it does few wonders for those not born in a fossil peasant house, that it is opposed to sustainability on many measures, does not mean it is not a viable strategy for those who were.

But the farmers also looked like the victims of a process which was beyond their own control. The development which had turned them into polluters was one which had the full, and seemingly coordinated, support of capital, the nation-state, and a fossil empire behind it. What were they to do against these powers? Once they had taken a few steps into this world—at a time when it all seemed very innocent—the magical powers of debt transferred their own decision-making power to the banks and the consultancies. When you are 50 million kroner into debt, how much can you really choose for yourself?

The strange thing, of course, was that the whole history appeared to them to be the result of individual decisions and the logic of exchange, as if these were natural forces. But then again, their individualistic tendencies were always mixed up with a feeling that they were just custodians and despite business side of it all, what really mattered was to hand down the family farm to the next generation. The fact that they themselves had made this impossible by scaling up did not seem to occur to them. Only a few thousand of them left, the farmers understood freedom to be a matter of growing roots in the landscape and passing it on to the next generation. They had learnt the hard way that those who do not keep their things in the strictest order will have to leave their ancestral form of life. Under coal, the peasant house grew increasingly hierarchical as new sources of labour were brought in from foreign places, as more exchange value was inscribed in the landscape, and as population pressure drove the farmers to protect their 20 or 30 hectares of land. The size of individual farms remained unchallenged as hierarchies grew until oil arrived. Then the need for people shrank and the thirst for land grew and grew. After a lifetime of oil, the farmers had command over few; their wives had taken jobs outside the farms, and their children had wandered off.

One afternoon I was standing in the sun with William at the backside of his farm. He looked down on the almost spotless lawn, and I realised that he had placed himself just above a thistle. He swung his heels inwards, grabbing a hold of the lonely weed. Lifting himself on his toes, he pulled the plant out of the lawn as he continued to talk about other non-chemical technologies for combating weeds. He had great faith in the robot he had just bought, but they are still too expensive for everybody to use except organic farmers who sell their crops at a higher price to the factory. Perhaps the new thing will be to combat weeds with electricity, zapping them at a high voltage.

He looked out over the landscape.

The farmer over there had an industrious father. Now he had 800 hectares. When he retires (soon, allegedly), who can buy his land? Worth a quarter of a billion—which is the same as a quarter of the pipeline—who other than a German

private equity firm could buy it? Perhaps a Swedish, Chinese, or an Argentinian one?

The farmers are an old bunch. Earlier, the next generation took over at a younger age. But now, as William said, 'the father is stuck until he is 60 or 65 years old. He doesn't believe that this other guy (his son) can do it'. Speaking of his own children, he said that,

> I hope that if some of them want to, they must be allowed to do it at a younger age. So, when they are in the beginning of their twenties, they must start thinking about it if they want to go that way. Not when they are thirty because then they will have a wife. You need five years in the beginning where you go day and night and want something and try something. Burn their fingers here and there. I had a father who let me take care of it myself. He wasn't afraid. I hope I will have the same approach when I get older. They must be allowed when they want to—just like you did in the older times (Interview 4).

Learning to see the world from the perspective of kinship offers a starting point for asking not only what the benefits of certain actions on and attitudes towards the land are now. It is an invitation to think about the meaning of our way of life generations ahead of us. At the same time, however, it allows the voices of our own ancestors to be heard as we take decisions about how to organise our landscapes. Seven generations ahead and seven generations back, the interests are more aligned than one would initially think. From this perspective, it seems that it is the fossil people who have deviated from their own long-term interests, as the goal of any form of life, natural or cultural, is its own self-perpetuity. As Åke Campbell pointed out almost one hundred years ago, the landscape always serves the conflicting interests of multiple masters. 'Even if one cultural system has defeated another, the latter may affect the landscape forms for a long time to come' (1936: 28). Now the time has come to take a renewed look at these traces of a more sustainable form of life which lie scattered around the countryside.

So far, no pipeline or any other climate mitigating measure has been implemented to stop, not to mention counter, the relentless depeasantisation which has rolled over the sleepless plains over the past 150 years. Access to land and a mode of subsistence in the landscape has not yet emerged as the human aspect of the planetary imperative to find ways to live without fossil fuels.

Just as fossilisation was a total social fact which imposed itself on all of us as if it wasn't the result of our own actions coming back to haunt us, the same is true of defossilisation. As individuals we stand powerless against the inertia of business-

as-usual. Each farmer has no choice but to abide by the rules of the game of musical chairs that play out on the landscape, no matter how cannibalistic this might be. Only as a collective do we stand a chance of creating new rules for this game. As seen from this corner of the world, the imperative to pull out the fossil fuels of the landscapes offers us a renewed chance to choose between our missions. We might continue putting our faith in technologies and thus continue the trajectory already drawn up in the Anthropocene. Or we might realise that if the ancient sunlight is left in the ground where it belongs, what will immediately be needed in a landscape like the Scandinavian plains will be people. With the new-found appreciation of their labour, they might cultivate another ecology and thereby a new form of life for themselves.

Bibliography

Aagesen, Aage. 1943. 'Danmarks Roebaner. Et Samfærdselsgeografisk Studie'. *Geografisk Tidsskrift* 46: 1–9.

Aare, Ane Kristine, Anna Umantseva and Laura Brandt Sørensen. 2024. 'Creating Dialogue as a Quiet Revolution: Exploring Care with Women in Regenerative Farming'. *Agriculture and Human Values* 42 (1): 271–288.

Ahl, Sofie Isager. 2023. *Regeneration. Gensidigt Helende Praksisser i en Ny Jordbrugsbevægelse*. Copenhagen: Laboratoriet for Æstetik og Økologi.

Ahmed, Amr. 2023. *Egypt Ignited. How Steam Power Arrived on the Nile and Integrated Egypt into Industrial Capitalism*. Lund: Media-Tryck.

Albris, Kristoffer, Matei Candea, Thyge Enggaard, Terne Sasha Thorn Jakobsen and Morten Axel Pedersen. 2025. 'Measuring MAN (Incorporating JRAI). Computational Anthropological Analysis and Quantitative Speculation. *Journal of the Royal Anthropological Institute* 0 (0): 1–23.

Allen, Robert. 2009. *The British Industrial Revolution in Global Perspective*. Cambridge and New York: Cambridge University Press.

Almevik, Gunnar and Lars-Eric Jönsson (eds), *Ménards Metod. Rekonstruktion och Inlevelse i Bebyggelseshistorisk Forskning*. Gothenburg: Gothenburg University.

Althusser, Louis and Étienne Balibar. 2009 (1965). *Reading Capital.* London: Verso.

Andersson, Sven. 1985. 'Statare Hade Det Som Forntidens Slavar'. Lars Olsson (ed) *Skånska Statare och Lantarbetare Berättar*. Stockholm: Tidens Förlag.

Araghi, Farshad A. 1995. 'Global Depeasantization, 1945–1990'. *The Sociological Quarterly* 36 (2): 337–368.

Auderset, Juri and Peter Moser. 2016. 'Mechanisation and Motorisation. Natural Resources, Knowledge, Politics, and Technology in 19th and 20th Century Agriculture'. Martiin, Carin, Juan Pan-Montojo and Paul Brassley (eds) *Agriculture in Capitalist Europe, 1945–1960. From Food Shortages to Food Surpluses*. London: Routledge.

Bachelard, Gaston. 2002 (1938). *The Formation of the Scientific Mind.* Manchester: Clinamen Press.

Barnard, Alan. 2017. 'Afterword'. Camilla Power, Morna Finnegan and Hilary Callan. *Human Origins. Contributions from Social Anthropology*. New York: Berghahn Books.

Barrett, Ross and Daniel Worden. 2014. *Oil Culture.* Minneapolis and London: University of Minnesota Press.

Bengtsson, Erik and Patrick Svensson. 2019. 'The Wealth of the Swedish Peasant Farmer Class (1750–1900). Composition and Distribution. *Rural History* 30: 129–145.

Bernstein, Henry. 2010. *Class Dynamics of Agrarian Change*. Boulder: Kumarian Press.

Biancardi, Enrico, Leonard W. Panella, Robert T. Lewellen. 2012. *Beta Maritima. The Origin of Beets*. New York: Springer.

Blom, Tore. 1986. *Ångplogar i Sverige 1861–1946. En Sammanställning i Ord och Bild*. Götene: Rubens Maskinhistoriska Samling.

Bollig, Michael. 2009. 'Kinship, Ritual and Landscape among the Himba of Northwest Namibia'. In M. Bollig and O. Bubenzer (eds) *African Landscapes.* New York: Springer.

Bonneuil, Cristoph and Jean-Baptiste Fressoz. 2016. *The Shock of the Anthropocene. The Earth, History, and Us.* London: Verso.

Boserup, Ester. 1965. *The Conditions of Agricultural Growth. The Economics of Agrarian Change under Population Pressure*. London and New York: Routledge.

Bottici, Chiara. 2007. *A Philosophy of Political Myth.* Cambridge: Cambridge University Press.

Boyer, Dominic. 2019. *Energopolitics, Wind and Power in the Anthropocene*. Durham: Duke University Press.

Boyhus, Else-Marie. 1973. 'Sukkerroedyrkningens Arbejdskraftproblemer'. *Lolland-Falsters Historiske Samfund Årbog*. Maribo: Lolland-Postens Bogtrykkeri.

———. 1976. 'Industribonden'. In Bjarne Stoklund (ed) *Det Forsømte Århundrede*. Dansk Kulturhistorisk Museumsforening.

Bourdieu, Pierre. 1977. *Outline of a Theory of Practice*. Cambridge: Cambridge University Press.

Brown, Vincent. 2020. *Tacky's Revolt. The Story of an Atlantic Slave War*. Cambridge: Harvard University Press.

Brox, Ottar. 1967. *Hva Skjer i Nord-Norge? En Studie i Norsk Utkantspolitikk*. Oslo: Pax.

Buck-Morss, Susan. 2009. *Hegel, Haiti and Universal History.* Pittsburgh, University of Pittsburgh Press.

Burton, Rob J. F. 2004. 'Seeing through the "Good Farmer's" Eyes. Towards Developing an Understanding of the Social Symbolic Value of "Productivist" Behaviour'. *Sociologia Ruralis* 44 (2): 195–215.

Burton, Rob J. F, Carmen Kuczera, Gerald Schwarz. 2008. 'Exploring Farmers' Cultural Resistance to Voluntary Agri-Environmental Schemes'. *Sociologia Ruralis* 48 (1): 16–37.

Carew, Anthony. 1987. *Labour under the Marshall plan. The Politics of Productivity and the Marketing of Management Science.* Detroit: Wayne State University Press.

Carsten, Janet. 1995. 'The Substance of Kinship and the Heat of the Hearth. Feeding, Personhood, and Relatedness among Malays in Pulau Langkawi'. *American Ethnologist* 22 (2): 223–241.

Carsten, Janet and Stephen Hugh-Jones (eds). 1995. *About the House. Lévi-Strauss and Beyond.* Cambridge: Cambridge University Press.

Campbell, Bruce M. et al. 2017. 'Agriculture Production as a Major Driver of Earth system Exceeding Planetary Boundaries'. *Ecology and Society* 22 (4): 8.

Campbell, Åke. 1936. *Kulturlandskapet. En Etnologisk Beskrivning med Särskild Hänsyn till Äldre Svenska Sandskapstyper.* Stockholm: Albert Bonniers Förlag.

Chayanov, A. V. 1986. *The Theory of Peasant Economy*. Madison: The University of Wisconsin Press.

Christiansen, Palle O. 1978. 'Peasant Adaptation to Bourgeois Culture? Class Formation and Cultural Redefinition in the Danish Countryside'. *Ethnologia Scandinavica*: 98–152.

———. 1982. *En Livsform på Tvangsauktion.* Copenhagen: Gyldendal.

Christensen, Jens. 1989. 'Nye Produktionsmetoder i Dansk Landbrug i 1950'erne og 1960'erne'. *Bol og By* 5 (1): 119–153.

Clark, Mathilde Walter. 2022. 'Roens Maestro'. Tine Fabienke (ed) *Dobbeltsyner. Ingemann Andersen i Danmark og Italien*. Fuglsang Kunstmuseum, KunstCentret Silkeborg Bad and Kastrupgårdsamlingen.

CONCITO. 2024. 'Impact and Opportunities of the 2023–27 CAP Reform in Denmark'. Concito.

Coronil, Fernando. 1997. *The Magical State. Nature, Money, and Modernity in Venezuela.* Chicago: University of Chicago Press.

Crutzen, Paul. 2002. 'The Geology of Mankind'. *Nature* 415 (23): 23.

Crutzen, Paul and Eugene Stoermer. 2000. 'The Anthropocene'. *Global Change Newsletter* 41: 17–8.

Cushman, Gregory T. 2014. *Guano and the Opening of the Pacific World*. Cambridge: Cambridge University Press.

Dackling, Martin. 2013. *Släktgårdens Uppkomst. Jord och Marknad i Skaraborg, 1845–1945.* Gothenburg: Göteborgs Universitet.

———. 2018. *I Stället för Äktenskap. Att Driva Jordbruk tillsammans med Syskon i 1900-talets Sverige.* Lund: Nordic Academic Press.

Damsholt, Tine. 2010. 'Til Kulturhistoriens Genealogi. En Diskussion af Kulturhistoriens Genstande og Strategier'. *Kulturstudier* 1 (1): 7–23.

Derrida, Jacques. 1996. *Archive Fever. A Freudian Impression*. Chicago: University of Chicago Press.

Douglas, Mary. 1966. *Purity and Danger. An analysis of the Concepts of Pollution and Taboo.* London and New York: Routledge.

———. 1969. 'Is Matriliny Doomed in Africa?' In Mary Douglas and P. M. Kaberry (eds) *Man in Africa*. London: Tavistock.

Dyrhauge, Helene. 2021. 'Political Myths in Climate Leadership. The Case of Danish Climate and Energy Pioneership'. *Scandinavian Political Studies* 44 (1): 13–33.

Egardt, Britta. 1962. *Hästslakt och Rackarskam. En Etnologisk Undersökning av Folkliga Fördomar*. Stockholm: Nordiska museet.

Eleonorasdotter, Emma. 2024. *Women's Drug Use in Everyday Life*. Cham: Palgrave MacMillan.

Ember, Marvin. 1967. 'The Emergence of Neolocal Residence'. *Transactions of the New York Academy of Sciences*: 291–302.

Engels, Friedrich. 1972 (1884). *The Origin of the Family, Private Property and the State*. Chippendale: Resistance Books.

Eriksen, Thomas Hylland. 2016. *Overheating: An Anthropology of Acceleration*. London: Pluto.

Eriksen, Thomas Hylland and Finn Sivert Nielsen. 2001. *A History of Anthropology.* London: Pluto Press.

Erixon, Sigurd. 1921. 'Gården och Familjen. Bidrag till Belysning av Storfamiljsystemets Förekomst i Sverige'. *Etnologiska studier tillägnade Nils Edvard Hammarstedt*. Stockholm: Svenska Teknologföreningens Förlag.

Evans-Pritchard, E. E. 1940. *The Nuer. A Description of the Modes of Livelihood and Political Institutions of a Nilotic People*. Oxford: Clarendon Press.

Fabienke, Tine (ed). 2022. *Dobbeltsyner. Ingemann Andersen i Danmark og Italien*. Fuglsang Kunstmuseum, KunstCentret Silkeborg Bad and Kastrupgårdsamlingen.

Ferdinand, Malcom. 2022. 'Behind the Colonial Silence of Wilderness: "In Marronage Lies the Search of a World"'. *Environmental Humanities* 14 (1): 182–201.

Fitzgerald, Deborah Kay. 2003. *Every Farm a Factory. The Industrial Ideal in American Agriculture.* New Haven: Yale University Press.

Flygare, Irene. 1999. *Generation och Kontinuitet. Familjejordbruket i Två Svenska Slättbygder under 1900-talet*. Uppsala: Upplands Fornminnesförenings och Hembygdsförbund.

———. 2001. 'Länkar, Agenter och Alternativ. Kvinnogenerationer i 1900-talets Jordbruk'. Britt Liljewall, Kirsti Niskanen and Maria Sjöberg (eds) *Kvinnor och Jord. Arbete och Ägande från Medeltid till Nutid*. Stockholm: Nordiska museet.

Flygare, Irene and Mats Isacson. 2005. *Jordbruket i Välfärdssamhället: 1945–2000.* Det Svenska Jordbrukets Historia vol. 5. Stockholm: Lagersberg.

———. 2011. 'The Tension between Modernity and Reality, 1945–2000'. Janken Myrdal and Mats Morell (eds), *The Agrarian History of Sweden. From 4000 bc to ad 2000*. Lund: Nordic Academic Press.

Folker, Louise, Astrid Pernille Jespersen and Esben Boeskov Øzhayat. 2025. 'Tooth Shame. An Ethnographic Study of the Choreographies of Tooth Shame in Danish Elderly Care'. *Social Science & Medicine* 365.

Fossat, Sissel Bjerrum (ed). 2024. *Den Sorte Omstilling. Fossile Brændsler og Livet i Byerne*. Copenhagen: Nord Academic.

Foster, John Bellamy. 1999. 'Marx's Theory of Metabolic Rift. Classical Foundations for Environmental Sociology'. *American Journal of Sociology* 105 (2): 366–405.

Fox, Robin. 1967. *Kinship and Marriage. An Anthropological Perspective*. Baltimore: Penguin books.

———. 1975. *Encounter with Anthropology*. Harmondsworth: Penguin.

Foucault, Michel. 1977. 'Nietzsche, Genealogy, History'. D. F. Bouchard (ed), *Language, Counter-Memory, Practice. Selected Essays and Interviews*. Ithaca: Cornell University Press.

———. 1994. *The Order of Things*. New York: Vintage Books.

Frandsen, Troels. 2023. 'Kampagnestart med Plads til Forbedringer'. *Sukkerroenyt* 41 (4): 3.

Frederiksen, Erhard. 1892. *Om Rodfrugtsdyrkningen: En Haandbog*. Copenhagen: Bianco Lunos Kgl. Hofbogtrykkeri.

Fressoz, Jean-Baptiste. 2024. *More, More, More. An All-Consuming History of Energy*. New York: Harper.

Fritzbøger, Bo. 1998. *Det Åbne Lands Kulturhistorie*. Frederiksberg: Biofolia.

Frykman, Jonas. 1977. *Horan i Bondesamhället.* Lund: LiberFörlag.

Frykman, Jonas and Orvar Löfgren. 1987. *Culture Builders: A Historical Anthropology of Middle-Class Life*. New Brunswick: Rutgers University Press.

Garberding, Petra. 2015. *Mellan Demokrati och Diktatur. Svensk och Tysk Folklivsforskning i Skuggan av Nazismen och Kalla Kriget.* Malmö: Roos & Tegner.

Garnert, Jan. 1993. *Anden i Lampan. Etnologiska Perspektiv på Ljus och Mörker.* Stockholm: Carlssons Bokförlag.

Gasson, Ruth and Andrew Errington. 1993. 'The Family Farm Business'. Wallingford: CABI Publishing.

Ginzburg, Carlo. 1991. *Ecstasies. Deciphering the Witches' Sabbath.* New York: Pantheon Books.

———. 1992 (1976). *The Cheese and the Worms. The Cosmos of a Sixteenth-Century Miller.* Baltimore: Johns Hopkins University Press.

Godelier, Maurice. 1972 (1969). *Rationality and Irrationality in Economics.* London: NLB.

———. 1977. *Perspectives in Marxist Anthropology*. Cambridge: Cambridge University Press.

———. 1986. *The Making of Great Men. Male Domination and Power Among the New Guinea Baruya.* Cambridge: Cambridge University Press.

———. 1999. *The Enigma of the Gift*. Cambridge: Polity Press.

———. 2011. *The Metamorphoses of Kinship.* London: Verso.

Goode, William. 1970. *World Revolution and Family Patterns*. New York: The Free Press.

Goody, Jack. 1976. *Production and Reproduction. A Comparative Study of the Domestic Domain*. Cambridge: Cambridge University Press.

Gow, Peter. 2001. *An Amazonian Myth and its History*. Oxford: Oxford University Press.

Graeber, David. 2006. 'Turning modes of production inside out: Or, why capitalism is a transformation of slavery'. *Critique of anthropology* 25 (1): 61–85.

———. 2011. *Debt. The First 5,000 years*. Brooklyn: Melville House.

———. 2014. 'Anthropology and the Rise of the Professional-Managerial Class'. *HAU: Journal of Ethnographic Theory* 4 (3): 73–88.

Graminius, Carin and Simon Halberg. 2025. 'Smallholder Hibernation. Moonlight Farming in the Age of Large-Scale Agriculture'. *Ethnologia Europaea* 55 (1): 73–84.

Gustavsson, Karin. 2014. *Expeditioner i det Förflutna: Etnologiske Fältarbeten och Försvinnande Allmogekultur under 1900-Talets Början* (Diss.). Stockholm: Nordiska Museets Förlag.

Hagemann, Gustav Adolph. 1875. *Om Forholdene paa St. Croix. En Confidential Indberetning*. Copenhagen: Bianco luno.

———. 1875a. *To the Planters of St. Croix*.

———. 1876. *Om Anlæg af Central Sukkerkogerier på St. Croix*. Copenhagen: Bibliotheca Regia Hafnia.

———. 1885. *Om Sukkerdyrkning og Sukkertilvirkning*. Copenhagen: Studentersamfundets Forlag.

———. 1915. *St. Croix*. Copenhagen: Politikens Tryk.

Hagström, Charlotte and Lena Marander-Eklund (eds). 2005. *Frågelistan som Källa och Metod.* Lund: Studentlitteratur, 2005.

Hagström, Charlotte and Carina Sjöholm. 2017. 'Nya Frågor till Gamla Svar. Frågelistor som Historisk Källa'. Lars-Eric Jönsson and Fredrik Nilsson (eds) *Kulturhistoria. En Etnologisk Metodbok.* Lund: Lund University.

Hajnal, John. 1982. 'Two Kinds of Preindustrial Household Formation system'. *Population and Development Review* 8 (3): 449–494.

Halberg, Eskil. 2020. *Madpakker til Revolutionen*. Copenhagen: Nemo.

Halberg, Simon. 2023. 'Birth of the Sleepless Land. The Arrival of the Sugar Beet and some Ethnological Observations on the Steam Plough and its Fossil Mode of Operation in Scandinavian Agriculture ca. 1880'. *Ethnologia Fennica* 50 (1): 108–140.

Hallgren, Lars, Hanna Ljunggren Bergeå and Helena Nordström Källström. 2020. 'Conservation Hero and Climate Villain Binary Identities of Swedish farmers'. Tema Milstein and José Castro-Sotomayor (eds) *Routledge Handbook of Ecocultural Identity.* New York: Routledge.

Hanieh, Adam. 2024. *Crude Capitalism. Oil, Corporate power, and the Making of the World Market*. London: Verso.

Hansen, Markus Christian. 2025. *The Politics of Natural Law. Agrarian Reform, Intra-Aristocratic Conflict, and Natural Jurisprudence in Denmark*, c. 1750–1800. PhD thesis. Lund University.

Hanssen, Börje. 1977. *Österlen. Allmoge, Köpstafolk & Kultursammanhang vid Slutet av 1700-talet i Sydöstra Skåne*. Möklinta: Gidlunds förlag.

———. 1979. 'Households, Classes, and Integration Processes in a Scandinavian Village over 300 years'. *Ethnologia Europaea* 11 (1): 76–118.

Haraway, Donna. 2016. *Staying with the Trouble. Making Kin in the Chthulucene*. Durham and London: Duke University Press.

Haraway, Donna, Noboru Ishikawa, Scott F. Gilbert, Kenneth Olwig, Anna L. Tsing and Nils Bubandt. 2016. 'Anthropologists Are Talking—About the Anthropocene'. *Ethnos* 81 (3): 535–546.

Harris, Marvin. 1968. *The Rise of Anthropological Theory*. New York: Thomas Y. Crowell company.

Hastrup, Frida and Marianne Lien. 2020. 'Welfare Frontiers? Resource Practices in the Nordic Arctic Anthropocene'. *Anthropological Journal of European Cultures* 29 (1): v–xxi.

Henningsen, Peter. 2002. 'Vejen til Thrinakria. Samtale med Bjarne Stoklund om Europæisk Etnologi'. *Fortid og nutid* 1: 306–321.

Herlitz, Lars. 1974. *Jordegendom och Ränta. Ömfordelningen av Jordbrukets Merprodukt i Skaraborgs Län under Frihetstiden*. PhD thesis in economic history: Gothenburg University.

Hesselbjerg, M. 1949. 'Loven af 31. Marts om Landbrugsejendomme'. *Tidsskrift for Landøkonomi* 135: 464–75.

Hobroh, Gunnar. 1944. 'Till de Skånska Pilvallarnas Historia'. *Meddelelser från Lunds Universitets Folkminnesarkiv* 4.

Hobsbawm, Eric. 1987. *The Age of Empire: 1875–1914*. London: Weidenfeld & Nicolson.

Hoff, Annette. 2004. 'Law and Landscape'. John Hines (ed) *Land, Sea and Home. Settlement in the Viking Period*. London: Routledge.

Holden, Clare J. & Ruth Mace. 2005. 'The Cow is the Enemy of Matriliny'. Ruth Mace, Clare J. Holden and Stephen Shennan (eds) *The Evolution of Cultural Diversity. A Phylogenetic Approach*. New York: Routledge.

Holmlund, Sofia. 2007. *Jorden vi Ärvde. Arvsöverlåtelser och Familjestrategier på den Uppländska Landsbygden 1810–1930*. Stockholm: Stockholms Universitet.

Holmström, Barry. 1983. *Äganderätt och Brukningsansvar. Idéer och Intressen i Svensk Jordpolitik.* Uppsala: Acta Universitatis Upsaliensis.

Hornborg, Alf. 2021. 'Imperial Metabolism. Empire as a Process of Ecologically Unequal Exchange'. Peter Fibiger Bang, C. A. Bayly and Walter Scheidel (eds) *The Oxford World History of Empire*. Oxford: Oxford University Press.

Howell, Signe and Marit Melhuus (eds). 2001. *Blod—Tykkere enn Vann? Betydninger av Slektskap i Norge.* Bergen: Fagbokforlaget.

Huber, Matthew. 2013. *Lifeblood. Oil, Rreedom, and the Forces of Capital.* Minneapolis: University of Minnesota Press.

———. 2022. *Climate Change as Class War. Building Socialism on a Warming Planet*. London: Verso.

Hugh-Jones, Stephen. 2001. 'Beyond Kinship. Social and Material Reproduction in House Societies'. *American Ethnologist* 28 (4): 958–9.

Høiesteretstidende. 1882. *Høiesteretsaaret 1881–82*. Copenhagen: Gad

Højrup, Ole. 1966. *Landbokvinden: Rok og kærne: Grovbrød og vadmel*. Copenhagen: Nationalmuseet.

———. 1975. 'Die Arbeitsteilung Zwischen Männern und Frauen in der Bäuerlichen Kultur Dänemarks'. *Ethnologia Scandinavica*.

———. 1959. 'Diskussionsinlägg'. *Den Gamla Bondkulturens Upplösning*. Föredrag och Diskussioner vid Fjortonde Nordiska Folklivs- och Folkminnensforskarmötet i Åbo.

———. 1963. 'Om Nationalmuseets Etnologiske Undersøgelser'. *Budstikken.*

Højrup, Thomas. 1983. *Det Glemte Folk. Livsformer og Centraldirigering*. Hørsholm: SBI.

———. 2003. *State, Culture, and Life-Modes. The Foundations of Life-Mode Analysis*. London: Routledge.

Højrup, Thomas and Niels Jul Nielsen. 2024. *Life-Modes in a Changing World Order. The Neoculturation of Life-Modes in a State System under Transformation*. Copenhagen: Nord Academic Press.

Hörnfeldt, Helena. 2009. *Prima Barn, Helt U. A. Normalisering och Utvecklingstänkande i Svensk Barnhälsovård 1923–2007* (diss.). Stockholm: Makadam.

IPCC. 2023. *Climate Change 2023. Synthesis Report. Contribution of Working groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. Geneva: IPCC.

James, C. L. R. 1938. *The Black Jacobins. Toussaint L'Ouverture and the San Domingo Revolution*. London: Secker & Warburg.

Jenkins, Timothy. 2010. *The Life of Property. House, Family, and Inheritance in Béarn, South-West France*. New York: Berghahn Books.

Jensen, S. P. 1985. 'Landbrugets Systemskifte 1870–1914 Belyst gennem Dagbøger og Regnskaber fra en Enkelt Gård'. *Bol og By* 1 (2): 56–89.

Jordbruksverket. 2023. *Statistikens Framställning. Priser på Jordbruksmark 2022*. Statens Jordbruksverk.

Jönsson, Lars-Eric and Fredrik Nilsson (eds). 2017. *Kulturhistoria. En Etnologisk Metodbok.* Lund: Lund University.

———. 2024. 'I Ménards Laboratorium. Inlevelse bland Rekonstruktioner, Kopior och Förfalskninger'.

Kirksey, S. Eben and Stefan Helmreich. 2010. 'The Emergence of Multispecies Ethnography'. *Cultural Anthropology* 24 (4): 545–76.

Kjærgaard, Thorkild. 1984. 'Gårdmandslinien i dansk historieskrivning'. *Fortid og nutid* 82: 82–95.

Kloppenburg, Jack Ralph. 1990. *First the Seed: The Political Economy of Plant Biotechnology*. Cambridge: Cambridge University Press.

Knight, Chris. 1995. *Blood Relations: Menstruation and the Origins of Culture*. New Haven and London: Yale University Press.

———. 2008. 'Early Human Kinship was Matrilineal'. In N. J. Allen, H. Callan, R. Dunbar and W. James (eds) *Early Human Kinship*. Oxford: Blackwell.

Knudsen, A. F. 1948. 'Landbruget og Marshall-planen (European Recovery Program, ERP)'. *Tidsskrift for Landøkonomi* 130: 285–299

Kristerson, Olof. 2001. *Jordberga Från Början till Slut. En Berättelse om Personer och Händelser i Söderslätts Betodlareföreningars Historia Åren 1094–2001.* Jordberga Boetodlareförening.

Kulick, Don. 1998. *Travesti. Sex, Gender and Culture among Brazilian Transgender Prostitutes*. Chicago and London: The University of Chicago Press.

———. 2021. 'When Animals Talk Back', *Anthropology Now* 13 (2): 1–15.

Kuuse, Jan. 1970. *Från Redskap till Maskiner. Mekaniseringsspridning och Kommersialisering inom Svenskt Jordbruk 1860–1910.* Göteborg: Meddelanden från Ekonomiskhistoriska Institutionen vid Göteborg Universitet.

———. 1983. *The Swedish Sugar Company Cardo 1907–1982.* Malmö: Cardo.

Kærgård, Niels and Tommy Dalsgaard. 2014. 'Dansk Landbrugs Strukturudvikling siden 2. Verdenskrig'. *Landbohistorisk Tidsskrift* 11 (1–2): 9–33.

Lampe, Markus and Paul Sharpe. 2018. *A Land of Milk and Butter: How Elites Created the Modern Danish Dairy Industry.* Chicago: University of Chicago Press.

Landbrug og Fødevarer. 2022. 'Landbrugets Drivhusgasser': https://lf.dk/media/el5lcs22/landbrugets-drivhusgasser-drivhusgasser-og-klimaaftryk-kort-fortalt-4.pdf

Larsen, Kasper. 2020. 'Sukkerfabrikker Udleder Næstmest CO_2 i Danmark—Er Gas eller El Løsningen?', *TV2 ØST*, November 17, 2020.

Larsen, Rasmus Blædel. 2016. *Vilkår, Vanskeligheder og Virkeligheder i Dansk Landbrug. En Etnologisk Undersøgelse.* Copenhagen: University of Copenhagen.

Laslett, Peter. 1977. *Family Life and illicit Love in Earlier Generations*. Cambridge: Cambridge University Press.

Latour, Bruno. 2017. *Facing Gaia: Eight Lectures on the New Climatic Regime*. Cambridge, Oxford and New York: Polity Press.

Lévi-Strauss, Claude. 1961 (1955). *Tropiques Tristes*. New York: Criterion Books.

———. 1964 (1962). *Totemism*. London: Merlin Press.

———. 1969 (1949). *The Elementary Structures of Kinship.* Boston: Beacon Press.

———. 1977 (1958). *Structural Anthropology*. Harmondsworth: Penguin Books Ltd.

———. 1981 (1971). *The Naked Man.* Chicago: The University of Chicago Press.

———. 1983 (1964). *The Raw and the Cooked*. Chicago: University of Chicago Press.

———. 1987 (1984). *Anthropology and Myth. Lectures 1951–1982*, Oxford: Blackwell.

———. 1987a. *Introduction to the Work of Marcel Mauss*. London: Routledge and Keegan Paul.

———. 1990. (1979). *The Way of the Masks*. Seattle: University of Washington Press.

Lewontin, Richard and J. P. Berlan. 1986. 'Technology, Research, and the Penetration of Capital: the Case of US agriculture'. *Monthly Review* 38 (3): 21–34.

Li, Tania Murray and Pujo Semedi. 2021. *Plantation Life. Corporate Occupation in Indonesia's Oil Palm Zone.* Durham and London: Duke University Press.

Lien, Marianne. 2015.*Becoming Salmon. Aquaculture and the Domestication of a Fish.* Oakland: University of California Press.

———. 2020. 'Dreams of Prosperity—Enactments of Growth. The Rise and Fall of Farming in Varanger'. *Anthropological Journal of European Cultures* 29 (1): 42–62.

Liljewall, Britt, Kirsti Niskanen and Maria Sjöberg. 2001. *Kvinnor och Jord. Arbete och Ägande från Medeltid till Nutid*. Stockholm: Kungl. Skogs- och Lantbruksakademien, Nordiska Museet och Sveriges Lantbruksuniversitet.

Lindner, Kolja. 2022. *Marx, Marxism, and the Question of Eurocentrism.* London: Palgrave Macmillan.

Lundh, Christer. 2003. 'Life-Cycle Servants in the Nineteenth century Sweden—Norms and Practices'. *Lund papers in economic history* 84.

Lundh, Christer and Mats Olsson. 2011. 'Contract-Workers in Swedish Agriculture, c. 1890s–1930s. A Comparative Study of the Standard of

Living and Social Status'. *Scandinavian Journal of History* 36 (3): 298–323.

Lynch, John et al. 2021. 'Agriculture's Contribution to Climate Change and Role in Mitigation is Distinct from Predominantly Fossil CO_2-Emitting Sectors'. *Frontiers in Sustainable Food Systems* 4.

Löfgren, Orvar. 1979. 'Landskap och Livsform'. *Odlingslandskap och Livsform*. Stockholm: Riksförb. för hembygdsvård.

———. 1980. 'Kvinnfolksgöra: Om Arbetsdelning i Bondesamhället'. *Kvinnovetenskaplig Tidskrift* 3 (3): 6–14.

McNeill, J. R. and Peter Engelke. 2016. *The Great Acceleration. An Environmental History of the Anthropocene since 1945.* Cambridge: Belknap Press.

Maggi, Wynne. 2001. *Our Women are Free. Gender and Ethnicity in the Hindakush.* Ann Arbor: The University of Michigan Press.

Magnuson, Torsten A. 1918. 'History of the Sugar Beet industry in California. *Annual Publication of the Historical Society of Southern California* 11 (1): 68–79.

Malinowski, Bronislaw. 1929. *The Sexual life of Savages in North-West Melanesia. An Ethnographic Account of Courtship, Marriage, and Family Life among the Natives of the Trobriand Islands, British New Guinea*. London: George Routledge & Sons, ltd.

———. 1965. *Coral gardens and their Magic. Soil-Tilling and Agricultural Rites in the Trobriand islands*. Bloomington: Indiana University Press.

———. 2005 (1922). *Argonauts of the Western Pacific*. London: Routledge.

Malm, Andreas. 2016. *Fossil Capital. The Rise of Steam Power and the Roots of Global Warming.* London: Verso.

———. 2016a. 'Who Lit This Fire? Approaching the History of the Dossil Economy', *Critical Historical Studies* 3 (2): 215–48.

———. 2018. 'Long Waves of Fossil Development. Periodizing Energy and Capital', *Mediations* 31 (2): 17–40.

Malm, Andreas and Wim Carton. 2024. *Overshoot. How the World Surrendered to Climate Breakdown.* London: Verso.

Malm, Andreas and Alf Hornborg. 2014. 'The Geology of Mankind? A Critique of the Anthropocene Narrative'. *The Anthropocene Review* 1 (1): 62–69.

Malmberg, Denise. 1991. *Skammens Röda Blomma. Menstruationen och den Menstruerande Kvinnan i Svensk Tradition.* Uppsala: Uppsala Universitet.

Marcus, George E. 'Ethnography in/of the World System. The Emergence of Multi-Sited Ethnography'. *Annual Review of Anthropology* 24: 95–117.

Marx, Karl. 1976 (1867). *Capital. A Critique of the Political Economy. Volume one.* Harmondsworth: Penguin books ltd.

———. 1907. *The Eighteenth Brumaire of Louis Bonaparte*. Chicago: Charles H. Kerr & Company.

Marx, Karl & Friedrich Engels. 1988 (1844). *The German Ideology*. Guilford: Prometheus Books.

Mau, Søren. 2023. *Mute Compulsion. A Marxist Theory of the Economic Power of Capital.* London: Verso.

Mauss, Marcel. 2016. (1925) *The Gift*. Chicago: HAU Books.

Meillassoux, Claude. 1981 (1975). *Maidens, Meal and Money. Capitalism and the Domestic Community.* Cambridge: Cambridge University Press.

Mellemgaard, Signe and Karen Fog Olwig. 2018. 'At Lede i Arkiver. Feltarbejde i Dokumenter', Helle Bundgaard, Hanne Overgaard Mogensen and Cecilie Rubow (eds). *Antropologiske projekter. En grundbog*, Frederiksberg: Samfundslitteratur.

Mikulic, Barnard. 2021. 'Sockerfabriken—en av Skånes Största Miljöbovar'. *SVT*, March 14, 2021.

Ministry of the Environment (Sweden). 2020. 'Sweden's Long-Term Strategy for Reducing Greenhouse Gas emissions'. *Government Offices of Sweden*: https://unfccc.int/sites/default/files/resource/LTS1_Sweden.pdf

Mintz, Sidney. 1985. *Sweetness and Power. The Place of Sugar in World History*. New York: Penguin Random House.

Mitchell, Timothy. 2013. *Carbon Democracy. Political Power in the Age of Oil*. London: Verso.

Moberg, Harald. 1989. *Jordbruksmekanisering i Sverige under Tre Sekel*. Stockholm: Kungl. Skogs och Lantbruksakademi.

Moore, Wilbert Ellis. 1966. *Economy and Society*. London and New York: Random House.

Morgan, Lewis Henry. 1871. *Systems of Consanguinity and Affinity in the Human Family*. Washington: Smithsonian institute.

———. 1877. *Ancient Society. Or, Researches in the Lines of Human Progress from Savagery through Barbarism to Civilization.* London: Macmillan & Company.

Murdock, George Peter. 1949. *Social Structure.* New York: The Free Press.

Narotzky, Susana. 2016. 'Where Have All the Peasants Gone?' *Annual Review of Anthropology* 45: 301–318.

———. 2021. 'Marxism in the Horizon. An Essay on Maurice Godelier'. *Dialectical Anthropology* 47: 377–390.

Nash, Manning. 1967. *Machine Age Maya. The Industrialization of Guatemala*. Chicago: University of Chicago Press.

Navarro, Tami. 2021. *Virgin Capital. Race, Gender, and Financialization in the US Virgin Islands*. Albany: SUNY Press.

Nellemann, George. *1981. Polske Landarbejdere i Danmark og deres Efterkommere. Et Studie af landarbejder-Indvandringen 1893-1929 og Indvandrernes Integration i det Danske Samfund i To Generationer*. Copenhagen: Nationalmuseet.

Netting, Robert McC. 1993. *Smallholders, Householders. Farm Families and the Ecology of Intensive, Sustainable Agriculture*. Stanford: Stanford University Press.

Nielsen, Niels Jul. 2004. *Mellem Storpolitik og Værkstedsgulv. Den Danske Arbejder—Før, Under og Efter Den Kolde Krig*. Copenhagen: Museum Tusculanum.

Nugent, Stephen. 2007. 'Some Reflections on Anthropological Structural Marxism'. *Journal of the Royal Anthropological Institute* 13 (2): 419–431.

Olsson, Lars. 1996. 'Labor Migration as a Prelude to World War I'. *The International Migration Review* 30 (4): 875–900.

———. 2002. 'I Sockerkapitalets Tjänst', In Lars Olsson and Jonna Eriksson, eds, *Säbyholmarna. Om Arbetsfolk, Arbetsförhållanden och Facklig Organisering på Säbyholms Gård, 1850–1945*. Landskrona: Arbetarrörelsens Arkiv.

Olsson, Lars and Jonna Eriksson (eds). 2002. *Säbyholmarna. Om Arbetsfolk, Arbetsförhållanden och Facklig Organisering på Säbyholms Gård, 1850–1945*. Landskrona: Arbetarrörelsens Arkiv.

Pedersen, Ove Kaj. 2023. *Myten om den Danske Model*. Copenhagen: Information.

Pfeiffer, Dale. 2006. *Eating Fossil Fuels. Oil, Food, and the Coming Crisis in Agriculture*. Gabriola Island: New Society Publishers.

Pina-Cabral, João de. 1986. *Sons of Adam, Daughters of Eve. The Peasant Worldview of the Alto Minho.* Oxford: Oxford University Press.

Pina-Cabral, João de and Carolin Leutloff-Grandits. 2012. 'The Importance of Kinship in Contemporary Anthropological Research'. *Ethnologie Française* 42: 384–90.

Pomeranz, Kenneth. 2001. *The Great Divergence. China, Europe, and the Making of the Modern World Economy.* Princeton: Princeton University Press.

Porsmose, Erling. 2008. *Danske Landsbyer.* Copenhagen: Gyldendal.

Price, Harry Bayard. 1955. *The Marshall Plan and its Meaning.* Ithaca: Cornell University Press.

Radcliffe-Brown, A. R. 1941. 'The Study of Kinship Systems'. *The Journal of the Royal Anthropological Institute of Great Britain and Ireland* 71 (1): 1–18.

Raulff, Ulrich. 2018. *Farewell to the Horse. The Final Century of our Relationship.* London: Penguin Books Ltd.

Raworth, Rachel. 2017. *Doughnut Economics. Seven Ways to Think like a 21st-Century Economist*. London: Penguin Random House.

Redfield, Robert. 1956. *Peasant Society and Culture. An Anthropological Approach to Civilization*. Cambridge: Cambridge University Press.

Rickard, Margit. 2002. 'Et Långt Liv på Säbyholm'. Lars Olsson and Jonna Eriksson (eds) *Säbyholmarna*. Landskrona: Arbetarrörelsens Arkiv.

Richardson, Katherine et al. 2023. 'Earth beyond Six of Nine Planetary Boundaries'. *Sci. Adv.* 9.

Rockström, Johan et al. 2009. 'A Safe Operating Space for Humanity'. *Nature* 461: 472–5.

Sahlins, Marshall. 1972. *Stone Age Economics.* Chicago and New York: Aldine Atherton, Inc.

Saito, Kohei. 2022. *Marx in the Anthropocene. Towards the Idea of Degrowth Communism.* Cambridge: Cambridge University Press.

SAPEA, Science advice for policy by European academics. 2020. *A Sustainable Food System for the European Union*. Berlin: SAPEA.

Solvang, Gunnar. 1985. 'Husmandsbevægelsen i Danmark 1880–1920'. *Bol og By* 1 (1): 59–86.

SEGES. 2018. *Strukturudviklingen i Landbruget 2016–2025.* Copenhagen: SEGES.

Shanin, Theodor. 1972. *The Awkward Class. Political Sociology of Peasantry in Developing Society*. Oxford: Clarendon Press.

Shiva, Vandana. 1988. *Staying Alive. Women, Ecology and Survival in India*. New Delhi: Kali for women.

———. 2008. *Soil not Oil. Environmental Justice in an Age of Climate Crisis.* Cambridge: South End Press.

Shove, Elisabeth and Mika Pantzar. 2005. 'Fossilization'. *Ethnologia Europaea* 35 (1): 59–62.

Sieferle, Rolf Peter. 2010 (1982). *The Subterranean Forest. Energy Systems and the Industrial Revolution*.

Siskind, Janet. 1975. *To Hunt in the Morning.* Oxford: Oxford University Press.

Sjöbeck, Mårten. 1925. 'Skånska Gärdesgårdar. Ett Bidrag till Kunskapen om deras Former och Utbredning'. *RIG*.

———. 1928. 'Om Gavlar i Skånska Allmogabyggnader. En Kortfattad Framställning'. *Tidskrift för Hembygdsvård*.

Skovgaard, K. 1951. 'Landbruget i 1950'. *Tidsskrift for Landøkonomi* 133: 1–51.

Skriver, Jens. 1986. 'Traktordriftens Gennembrud i Danmark 1945–65'. *Bol og By* 2 (1): 133–178.

Sommestad, Lena. 2012. *Från Mejerska till Mejerist. En Studie av Mejeriyrkets Maskuliniseringsprocess.* Lund: Arkiv Förlag.

Smil, Vaclav. 2001. *Enriching the Earth. Fritz Haber, Carl Bosch, and the Transformation of World Food Production*. Cambridge: The MIT Press.

Snedker, Kjeld. 1973. 'Sukkerroedyrkningens Redskaber og Maskiner'. *Lolland-Falsters Historiske Samfund Årbog*. Maribo: Lolland-Postens Bogtrykkeri.

Soper, Kate. 2020. *Post-Growth Living. For an Alternative Hedonism*. London: Verso.

Spencer, Jonathan. 2002. 'Marxism and Anthropology'. Alan Barnard and Jonathan Spencer (eds) *Encyclopedia of Social and Cultural Anthropology*: London and New York: Routledge.

Steensberg, Axel. 1961. 'De Sidste Århundreders Ændringer i den Danske Bondekultur'. *Den Gamla Bondkulturens Upplösning. Föredrag och Diskussioner vid Fjortonde Nordiska Folklivs- och Folkminnensforskarmöteet i Åbo* 1959. Åbo.

Steffen, Will et al. 2004. *Global Change and the Earth System. A Planet under Pressure.* Heidelberg: Springer Berling.

Steffen, Will et al. 2015. 'The Trajectory of the Anthropocene. The Great Acceleration'. *Anthropocene Review* 2 (1): 81–98.

Stoklund, Bjarne. 1985. 'Economy, Work and Social Roles. Continuity and Change in the Danish Island Community of Læsø, ca. 1200–1900'. *Ethnologia Europaea* 15 (1): 129–163.

———. 2006. 'Bygder, Aktivitetsfelter og Økotyper. Etnologien og de Regionale Variationer'. Per Grau Møller and Mette Svart Kristiansen, eds, *Bygder*, Auning: Landbohistorisk selskab.

Sutherland, Lee-Ann and Ika Darnhofer. 2012. 'Of Organic farmers and "Good Farmers". Changing Habitus in Rural England'. *Journal of Rural Studies* 28 (3): 232–240.

Sveistrup, P. P. 1942. 'Bidrag til de Dansk-Vestindiske Øers Økonomiske Historie, med Særligt Henblik paa Sukkerproduktion og Sukkerhandel'. *Nationaløkonomisk Tidsskrift* 80: 65–183.

Sveistrup, P. P. & Richard Willerslev. 1945. *Den Danske Sukkerhandels og Sukkerproduktions Historie*. Copenhagen: Nordisk Forlag.

Svensson, Birgitta. 1993. *Bortom All Ära och Redlighet. Tattarnas Spel med Rättvisan.* Stockholm: Nordiska Museets Förlag.

———. 2002. 'Etnologin mellan Kulturhistoria och Samtidsanalys'. *RIG* 85 (2): 65–71.

Svensson, Patrick. 2006. 'Peasants and Entrepreneurship in the Nineteenth-Century Agricultural Transformation of Sweden'. *Social Science History* 30 (3): 387–429.

Svensson, Sigfrid. 1961. 'Nyhetsspridare och Traditionsbrytare'. *Den Gamla Bondekulturens Upplösning. Foredrag och Diskussioner vid Fjortonde Nordiska Folklivs- och Folkminnesforskarmötet i Åbo 1959*. Åbo.

———. 1977. *Från Gammalt till Nytt. På 1800-talets Svenska Landsbygd*. Stockholm: LT:s Förlag.

Sylvasti, Tiina. 2003. 'The Cultural Model of the "Good Farmer" and the Environmental Question in Finland'. *Agriculture and Human Values* 20 (2): 143–150.

Szeman, Imre. 2019. *On Petrocultures. Globalization, Culture, and Energy*. Morgantown: University of West Virginia.

Terray, Emmanuel. 1972 (1969). *Marxism and 'Primitive' societies. Two Studies.* New York: Monthly Review Press.

Thorsen, Svend. 1988. 'Pilehegn og Risgærder', *Lolland-Falsters Historiske Samfund Årbog*: 78–91.

Thunström, Per. 2017. *Traktorernas Intåg. Teknik, Produktion och Marknadsföring i Sverige under Introduktionstiden 1905–1930.* Uppsala: Sveriges Lantbruksuniversitet.

Tomich, Dale. 1990. *Slavery in the Circuit of Sugar. Martinique and the World Economy, 1830–1848*. Albany: SUNY Press.

Torell, Ulrika. 2015. *Socker och Söta Saker. En Kulturhistorisk Studie av Sockerkonsumtionen i Sverige.* Stockholm: Nordiska Museets Förlag.

Trautmann, Thomas. 1987. *Lewis Henry Morgan and the Invention of Kinship.* Berkeley: University of California Press.

Trouillot, Michel-Rolph. 1988. *Peasant and Capital. Dominica in the World Economy*. Baltimore: Johns Hopkins University Press.

———. 1995. *Silencing the Past. Power and the Production of History.* Boston: Beacon Books.

Trundle, Catherine, John Gardner and Tarryn Phillips. 2024. 'The Ethnographic Interview. An Interdisciplinary Guide for Developing an Ethnographic Disposition in Health Research'. *Qualitative Health Research* 0 (0).

Tsing, Anna. 2012. 'On Nonscalability: The Living World is not Amenable to Precision-Nested Scales'. *Common Knowledge* 18 (3): 505–524.

———. 2015. *The Mushroom at the End of the World: On the Possibility of Life in Capitalist Ruins*. Princeton: Princeton University Press.

Tyson, George. 1995. '"Our Side". Caribbean Immigrant Labourers and the Transition to Free Labour on St. Croix, 1849–79'. Karen Fog Olwig (ed) *Small Islands, Large Questions.* London: Routledge.

van der Ploeg, Jan Douwe. 2008. *The New Peasantries. Struggles for Autonomy and Sustainability in an Era of Empire and Globalization.* London: Earthscan.

———. 2014. *Peasants and the Art of Farming. A Chayanovian Manifesto*. Rugby: Practical Action Publishing.

Veltmeyer, Henry and Arturo Ezquerro-Cañete. 2023. 'Agro-Etractivism'. *Journal of Peasant Studies* 50 (5): 1673–1686.

Vinding, Poul. 1942. *G.A. Hagemann. En Dansk Ingeniørs Levnedsløb*. Copenhagen: Gad.

von Sydow, Carl Wilhelm. 1934. 'Geography and Folk-Tale Ecotypes'. *Béaloideas* 3: 344–355.

Wainwright, Joel and Geoff Mann. 2018. *Climate Leviathan. A Political Theory of our Planetary Future.* London: Verso.

Williams, Eric. 1944. *Capitalism and Slavery*. Chapel Hill: The University of North Carolina Press.

Wilson, Sheena, Adam Carlson and Imre Szeman (eds). 2017. *Petrocultures. Oil, Politics, Culture*. Montreal: McGill-Queen's University Press.

Wissen, Markus and Ulrich Brand. 2021. *The Imperial Mode of Living. Everyday Life and Ecological Crisis of Capitalism.* London: Verso.

Wohlin, Nils Richard. 1910. *Faran av Bondeklassens Undergräfvande Sammanhang med de Gamla Arfvejord Åskådningarnas Upplösning, Emigrationen och Bondjordens mobilisering.* Stockholm: Norstedt & Söner.

Wolf, Eric. 1955. 'Types of Latin American Peasantry. A Preliminary Discussion. *American Anthropologist* 57 (3): 452–71.

———. 1966. *Peasants*. Englewood Cliffs: Prentice-Hall, Inc.

———. 1969. *Peasant Wars of the Twentieth Century*. New York: Harper & Row.

Wolfe, Patrick. 2016.*Traces of History. Elementary Structures of Race*. London: Verso.

Wulff, J. 1876. *Report on Sugar Manufacturing in St. Croix, etc 1874*. St. Croix.

Zenius, Marianne. 1982. *Landbokvinden i det 20. Århundrede*. Copenhagen: Gad.

Zimmerman, Angela. 2010. *Alabama in Africa: Booker T. Washington, the German Empire, and the Globalization of the New South.* Princeton: Princeton University Press.

Örjangård, Sigurd. 1947. *Anor och Minnen. Svenska Släktgårdar genom Sekler.* Stockholm: LT:s Förlag.

SLEEPLESS PLAINS

Fossilisation and Peasant Kinship in Scandinavia

What does it mean to live with fossil fuels? This question imposes itself on us with increasing weight when the necessity of living without them becomes harder and harder to deny. Studying farmers in the sugar beet districts on plains of Southern Scandinavia, this book investigates the history and ethnography of a troubled relationship between subterranean energy and everyday life. What practices and modes of life were abandoned when fossil energy was adopted by Scandinavian farmers? How was the transition accomplished? What steps and actions can be detected? What practices and modes of life came as a result? And what were the wider implications for peasant culture?

Based on fieldwork and archival sources, *Sleepless Plains* proposes an ethnological theory of fossilisation to answer these questions. Integrating ethnological perspectives on kinship with Marxist theories of the social roots of global warming, this book analyses what peasant life has become in the Anthropocene. The goal of the work is to explore how fossilisation has shaped not only the landscape and agricultural forms of life but also dominant ways of thinking about social possibilities. In this light, the necessity of defossilisation becomes an opening to ask what one might do with the landscape and with kinship in it in the future.

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