Possible study schedule

A suggested 9 week study schedule:

- Chapter 1: Setting the scene, the fossil economy (read chapter 2 if you like, or come back to that later with chapter 12)
- Chapters 3 and 4: Energy types and prime movers; proto-fossil economy; the industrial revolution and the first structural crisis
- Chapters 5 and 6: the advantages of water, and of reservoirs and aqueducts; some peculiarities of the capitalist mode of production
- Chapters 7 and 8: advantages of steam in time and space, for capitalist exploitation
- Chapters 9 and 10: Ideology for and against steam; the general strike and chartism
- Chapters 11, 2 and 12: The fossil economy consummated; different theories of the transition
- Chapter 13: A theory of fossil capital
- Chapter 14: Fossil capital today
- Chapters 15 and 16: transitioning, where next

Chapter 1

Consider the following quotations and questions:

“In the 1990s, the annual increase in global CO2 emissions stood at an average 1 percent; since 2000, the figure has been 3.1 percent — a tripled growth rate, exceeding the worst-case scenarios developed by the IPCC and expressing a trend that still does not show any sign of reversal: the more knowledge there is of the consequences, the more fossil fuels are burnt.” (p.3)

Is he correct about this trend?

What questions or challenges does this trend pose for us?

“What do we mean by 'the fossil economy'? A simple definition would be: an economy of self-sustaining growth predicated on the growing consumption of fossil fuels, and therefore generating a sustained growth in emissions of carbon dioxide.” (p.11)

What other kinds of economy or society have their been or could there be?

Does it make sense to have “growth” in this definition?

What variants of fossil economy might there be?

““the fossil economy, under this definition, cannot account for all human influence on the climate. Fossil fuel combustion is only one cause of global warming. […] But it is safe to say the burning of fossil fuels is the hard core of the problem [of global warming], quantitively dominant and qualitatively determinant. It deserves special focus.” (p.11 — see the whole quotation)

What other causes of global warming are there? How about other environmental crises beyond global warming?

Is Malm right about fossil fuel's centrality?

“The fossil economy has the character of a totality, a distinguishable entity” (p.12)

What does this mean? Is it correct?

What value is there to us in understanding the transition to a fossil economy?

Do attempts to compare this transition with future transitions make sense?

How does imperialism fit into all of this?

Chapter 2

Questions:

What are the different theories of the transition to the fossil economy? What is the driving force in each case? What issues are there with each theory?

Is Malm simply reversing the direction of causation from what he terms “productive force determinism”? Or are — or could there be — there more complex causal relations?

Are there other plausible theories, not mentioned?

What empirical differences would each theory “predict” us to find in the historical record?

Chapter 3

Consider the following questions and quotations:

What does “prime mover” mean?

Malm categorises prime movers, or types of energy available at the time according to their spatiotemporal profile, all sourcing energy purportedly from solar thermonuclear reactions. Write down as many sources of energy from the time as you can think of, according to these categories. What are the pros and cons, or particular features of each types?

What social changes went hand in hand with the initial shift from burning wood and plants, to burning coal, and why?

“a proto-fossil economy is one in which 1) a coal industry has developed, with underground mines and regular trade; 2) coal has become the major source of heat in the domestic sphere; 3) coal has penetrated industry as a heat provider; 4) domestic consumption is predominant; and 5) impressive rates in coal consumption are achieved during the phases of substitution, without any self-sustaining economic growth being predicated on fossil fuels.” (p.52)

Why is the difference between a fossil economy and a proto-fossil economy important? And between a proto-fossil economy and an economy where coal is occasionally used?

“A novel logic of self-fuelled expansion was implanted into the British economy[…] 'Cotton with its new technology and organisation originated a process of “development” with *_qualitative changes_* not present' in the surroundings, namely: ceaseless improvements in productivity, high rates of profit, reinvestment of profits and thereby , output multiplying — *_continuous accumulation of industrial capital_*. Self-sustaining growth had arrived.” (p. 47)

What were the main prime movers driving the early industrial revolution?

“The process cries out for an explanation not only of why it happened so late, but of *_why steam power was adopted at all_*” (p.57)

Extra: If you like, also consider the following questions and quotations:

Where would wood burning fit into Malm's energy spatiotemporal categorisations?

Coal has perhaps twice as much energy per kilogram as dry wood, more than twice compared to wet wood. Coal is also around twice as dense than wood, in mass per volume. This means it has around four times as much energy by volume. What was more important at the time, saving weight or saving volume? Were there any other advantages to each fuel?

“'in the absences of new uses for very substantial quantities of coal further rapid growth could only come *from rising population.*' That rise was slow.” (p.50)

How about modern energy sources? Nuclear, geothermal energy, and tidal power do not derive their power from sunlight. Does this matter for Malm's historical account? Where would an adapted spatiotemporal categorisation place them?

Or does electrification and integrated electricity and gas infrastructure make such a categorisation now less useful? That is, is the real division nowadays between — for example — electricity, petrol, and gas, in most cases? What are the spatiotemporal profiles of these? (See also the final chapters)

Chapter 4

Why did the structural crisis discussed in pp.58-63 happen?

What were its immediate impacts?

Why were mule-spinners so industrially powerful?

What did they achieve with this power?

What was the ruling class reaction to this?

How are this crisis and these class struggles linked?

“the workers of Preston demanded a wage hike by 18% as their legitimate share of the recent prosperity. The masters responded with an offer of a 10 percent rise, on the condition that all spinners sign an agreement to not belong to any union whatsoever: negotiations over wages turned into an open dispute over power in the mills. The 650 spinners of Preston refused[…] the cotton capitalised seized the initiative” (pp.66-67)

How does automation relate to prime movers?

What inspiration or lessons can we take from the militancy of the workers then?

Why was there a shift to power-looms when animate powered weaving was cheaper in itself?

Chapter 5

In the 1820s, what were the relative shares of each spatiotemporal category, or specific type, of prime movers?

List all the advantages of water over steam which there still were at the time when the transition to more steam than water happened. (See Chapter 6 as well.)

Chapter 6

What advantages could using reservoirs and aqueducts bring to water power, in the location and reliability of factories, or any other ways?

“Schemes for massive collective reservoirs proved divisive, pitting mill-owners against mill-owners. […] In more general terms, *_the splintering forces of competition contradicted the demand for close coordination inherent in the schemes_*: all must share the flowing water, but the manufacturers kept their immediate private interests closer to heart.” (p.114)

“Ironically, the same spatiotemporal profile of coal that made it dearer than water also made it more appropriate for capital. […] Not what should be expected by enlightened entrepreneurs.”

“reservoir projects required considerable *_skills_* in engineering and management […] the engine won over the wheel because it was the *_less advanced_* productive force” (p.120)

****Extra:****

What role did economic crises play in making aqueducts and reservoirs less attractive to capitalists?

If we take a step back from the capitalist context, did the proposed water systems actually require more human co-operation overall than the coal and steam system, considered as a unity?

What does this all say about capitalism? (See also the next two chapters)

On one reading of this chapter, you could get the impression that Malm believes that either water and steam could have been viable prime movers for capitalists in general, that both futures were possible, going forward. That it was just luck, or the timing of the crisis, which led to the steam option. What do you think? (See also the next two chapters)

Chapter 7

What did steam and water encourage and permit in factory locations? In terms of positioning relative to geology, to coal mines, to fast flowing or stationary water, to each other? How mobile were they, how free were such choices? If aqueducts didn't run into the difficulties for capitalists discussed in the previous chapters, could they change these restrictions for water?

“It was the mechanical centralisation of the non-human prime mover, its *_propulsion of an integrated process of production_* that set the factory apart[…] the regime of *_factory discipline_*, which was, when it first appeared, intensely repugnant to most.” (127-8)

What were the advantages of towns for capitalists in procuring workers: in quality, quantity, prior experience, and ease of procuring them? How pressing were these considerations?

How about factory colonies? How did it make capitalists more vulnerable to and dependent upon their workers? Did the economic crisis change things? How about the uptick in class struggle?

Did steam encourage the growth of towns, vice versa, or both?

“The core of the strike was entirely homegrown […] 'They first demolished the windows of several cottages, and also those of the school'[…] the riot was nothing out of the ordinary at the time” (pp.141-142)

It had been preached that factory colonies would offer a safe haven to capitalists from the “unruly” class struggle in towns. What does the reality tell us about class struggle?

What impact did the victory of the working class in winning the factory acts have on the relative attractiveness of different energy sources?

“Hence the transition was all about power, in the dual sense. *_The very same desire for subordinated human labour that animated automation drove cotton capital towards steam._*” (p.156)

__Extra:__ How does this relate to the Marxist idea of “abstract labour” in capitalism?

“Automation and transition were two dimensions of a singular historical process” (p.163)

Chapter 8

What advantages and disadvantages did steam have over water power in reliability? How would aqueducts and reservoirs have changed this?

How did the increase in international export change this? And the development of more expensive machines? What other natural and social factors around the time of the transition?

What inspiration and lessons can we take from the movement to win the factory acts?

What impact did these have on the transition to steam power? What does this tell us about the role of class struggle in shaping society and the environment?

How and why were there increases in labour productivity in the following decades?

Do these improvements suggest that steam was inevitably, on technological merit alone, always going to replace steam?

Chapter 9

How does the ideology around steam and machines reaffirm the ruling-class's perspectives, and erase or subjugate the working-class in its portrayal?

Can you see parallel ideologies today?

Did or does this ideology have a big impact?

Chapter 10

What is the significance of the working-class anti-steam demonology?

“In terms of numbers involved, geographical extension, duration, sheer insurrectionary fervour and near-revolutionary dynamics, the general strike of 1842 was the greatest revolt of the British working class in the nineteenth century. It was also the first general strike in the history of any capitalist country.” (p.226)

“In the summer of 1842, Chartism had been on the march for four years[…] Chartism had its main base in the textile industry.” (p.227)

The sabotage in this wave of class struggle could be interpreted as choosing targets based on anti-steam ideology. An alternate interpretation, less covered by Malm, is that they were tactically choosing targets to cause maximum disruption. What do you think?

Chapter 11

“By 1870, three times as much coal was burnt in general manufacturing, iron, and steel than in the hearths and homes of Britain, the fires decoupled from population growth and linked to self-sustaining *_economic_* growth.” (p.250)

What role, quantitively and qualitatively, did cotton play in this transition?

Chapter 12

What does the history Malm has sketched in the previous chapters mean for the different theories of the transition, outlined here and in chapter 2? (See also chapter 13)

“self-sustaining growth [i]s an *_emergent property_* of capitalist property relations rather than as an attribute of the human species [driven by an imperative] rooted 'in historically specific social relations, constituted by human agency and *_subject to change_*'. (p.263)

What role have proto-fossil economies had in contributing to climate change?

In what ways — quantitively over history or around the world today, or in a historical causal explanation — do attempts to point the finger to population as the cause of climate change and other environmental destructions fail to line up with reality?

What are the political impacts of people (such as David Attenborough) pedalling such ideas?

****Extra:****

Is his characterisation of Marx, or Marxists, correct? (see also Chapter 2, and other chapters)

Consider the causal diagrams on page 277. Does productive force determinism or constructivism seem more persuasive? Is there a third possibility?

How big an issue is it that Malm gives no serious account of the Stalinist states' use of fossil fuels?

Is he right to refer to these states as “Communist”, as not capitalist, as “adversaries” to capitalist states?

What role does the historical account in this book have — if any — in helping us imagine, or to organise to move beyond, capitalism?

Chapter 13

Can you summarise how capitalist property relations work? (In general at first, without looking at fossil fuels, e.g. looking at the first few pages)

What are meant by the following terms, in Marxist terminology? Property relations; means of production; direct producers; class of exploiters; labour; use-value; exchange-value; value; labour power; capitalist property relations; commodity; consumption; productive consumption; production; accumulation of capital.

“To earn his profit, the industrial capitalist must take a detour through nature, setting up some version of 'the metabolic interaction [*Stoffwechsel*] between man and nature, the everlasting nature imposed condition of human existence' within his precincts.” (p. 283. We can treat stoffwechsel, metabolic interaction, and metabolism as synonymous)

See figure 12.2, page 291. Can you explain in words the main processes going on (mainly 1 and 2)? It may help to write out the formula with full words.

Why does the process fossil capital lead to increasing emissions, i.e. increasing *rates* of CO2 output?

Is the process of fossil capital more important than the process of primitive accumulation of fossil capital? Is it more important than consumption?

“At a certain stage in the historical development of capital, fossil fuels become a necessary material substratum for the production of surplus value[…] they are utilised *across the spectrum of commodity production* as the material that sets it in physical motion. […] These have now become *the general lever for surplus-value production*.” (p.288)

How does fossil energy produce abstract space and time, and how does that help capital?

In what ways did the early historical primitive accumulation of fossil capital contribute to the expansion of capitalist property relations?

Chapter 14

How does the nature of internationally mobile capital (allegedly) refute the claims of eco-modernism, and in fact turn them on their head?

How is this impacted by inequality of workers' rights, wellbeings, and employment; of infrastructure and workers' skills and discipline; of health and safety and technological standards, and; of consumer power?

How does class struggle shape this all?

What does this understanding mean for how we should think about nationalism, free movement, economic integration, and working class internationalism?

What is the Jevons paradox?

What contribution does Malm claim automation has to climate crises? Is he correct in his analyses of this? If not, how does this mistake impact his overall argument?

What similarities and differenced do historical and contemporary primitive accumulation of fossil capital have?

What barriers are there to a transition away from fossil fuels? Are these barriers shrinking or growing? What does this mean for our organising and politics?

Is Malm's account of why people aren't rising up more to demand change convincing? What other more convincing causes might there be? How should our answer to this impact our approach to activism?

What dangers may there be in consumer politics?

Extra:

How important is the question of who we should allocate responsibility for given emissions to? How should we do this?

Chapter 15

Malm arguably equates the transition with a “return to the flow”. Is this right?

What particular issues does capital have with renewable energy, investing in it, transitioning?

What issues do small-scale energy generation, supplying only local needs, create for capital? What issues may it create under socialism?

How about large-scale renewable energy generation?

What is the Lauderdale paradox?

What are the obstacles to abandoning fossil fuel production? What implications does this mean for the transition?

Extra: Malm does not mention nuclear energy (and says less than we might like about geothermal and tidal). Using what he does say about other energy, what can we say about what difficulties this may or may no have in capitalism?

Why do you think he doesn't mention it?

What do you think is a better post-capitalist vision, a tearing apart of abstract spatiotemporal relations, or mass international co-operation?

You can find sections of the left advocating either vision. Why is this?

Could these difficulties for in transitioning within capitalism be overcome by a powerful working-class environmentalist movement, short of overthrowing capitalism as a whole? How, if at all, are the two aims of immediate reforms and the revolutionary overthrow of capitalism related?

Chapter 16

“For the foreseeable future — indeed, as long as there are class societies on earth — there *will* be liefeboats for the rich and privileged, and there will *not* be any shared sense of catastrophe.” (p.391)

“a more scientifically accurate designation, then, would be 'the Capitalocene'.” (p.391)

“There is, then, another way to measure CO2: as an effluent of power, of *our* defeats and *their* victories.” (p.392)

Can you think of counterexamples? What advantages and dangers are there to this perspective?

Malm does not say much about how we can build a movement to win the changes we need, and indeed a sense of defeatism comes across. What can we take from the previous historical and theoretical chapters to inform our activism? What does this understanding tell us about the role of class struggle, internationalism, socialist ideas, or of organising for a revolutionary overthrow of capitalism?