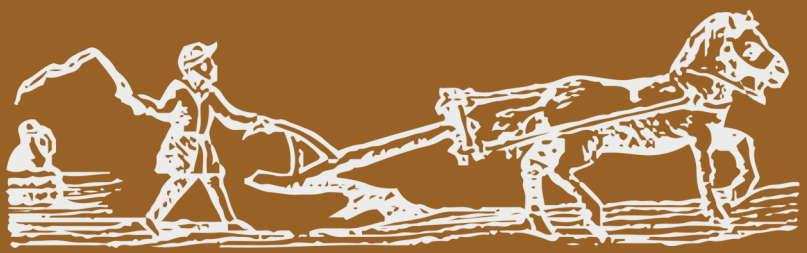
A Theory Kit for World History

Janken Myrdal



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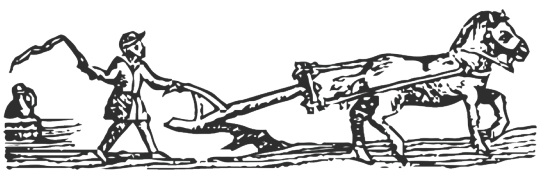

Swedish University of Agricultural Sciences
Department of Urban and Rural Development
Division of Agrarian History

Ämnet agrarhistoria är en historisk disciplin som omfattar en utveckling från äldsta tid till nutid. Ämnet handlar om den agrara produktionen och den tekniska utvecklingen, sociala och ekonomiska förhållanden, människorna i agrarsamhället samt deras relation till naturen, landskapet och samhället i stort. Tyngdpunkten ligger på forskning och undervisning om nordeuropeiska förhållanden, bland annat Sverige, även om också en vidare internationell agrarhistoria är viktig för ämnet.

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Preface

A preface is a post-face (etymologically "pre" is before, and "fari" is speech): words before are words articulated after finishing the main body of text. I have felt as if the text owned me, and used me as a tool in its becoming. I have mismanaged other obligations, and tried to escape many times but the text caught me and forced me to go on. I know of course that is not true, I have driven myself. To try to give a complete explanation smacks of conceit, but I hope something else is behind this project: I wanted to know if there was a common story to what I had been thinking about most of my life. In my last year at high school (gymnasium), more than half a century ago, I worked with a long report on technological sequences through history, from the Stone Age to the medieval period. Much of my life since has revolved around similar or connected questions. Now at the dusk of life I wondered if all my investigations were connected into a consistent grid of ideas. I knew that a dialectical reasoning — everything is the opposite of what it is, and also the same – lay behind many of my ideas.

The text is a by-product of several projects.[1] As it is a summing-up of decades of gathering and organizing knowledge, a list of everyone who has helped me through the years could be as long as a preface to a scholarly tome from the US, so I will restrict myself here to but a few among the many: Arne Jarrick, Eva Rystedt, Patrick Svensson, Ingrid Söderlind, Anders Wästfelt, Mats Widgren and the seminar at the section of Agricultural History. Rosemary Nordström and Arwen Jewell have polished my English.

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[1] Mapping World Agricultural Systems; Conflict, cooperation and equality; The Miracle Bean: Agrofood globalization through the lens of the soybean. I also got economic support from Kgl. Vitterhetsakademien.

Content

Introduction

The aim

Humans are both a part of nature and facing nature, and the destiny of humans is:

Humans transform nature and are thereby transformed.

This is a fascinating sentence, but it has not been my life's work to produce such succinct aphorisms. The real truth is in the interstices between the words, for in these gaps a multifarious universe unfolds: human practice and mind interacting over time in an enormously convoluted cultural process. Such a dynamic demands a complex explanation.

I do not intend to present theories on a single factor, or maybe two, in an attempt to explain practically everything. Many world historians present one cause or another as "The Factor" that explains almost everything. They are probably not trying to adapt their results to make them palatable to the general public; instead, they are surely trying to highlight an underestimated factor and, in that limited sense, such contributions can be worthwhile.

What I am presenting is a web of interrelated categories on various levels. Among the topics touched upon are human particularity, world systems and the material and social spheres. A "kit" of theories regarding major processes in human history is laid out and formed into a whole, where the aim is to understand these processes in a longue durée over thousands of years. The whole text is thus labelled a "*theory kit*" as it contains several linked elements of theory.[2] Underlying this is a fundamental

[2]I also considered "theory box", but many of my theories are outside the conventional box. A short presentation of many concepts and theories in Burke 2005, and also Wikipedia of course, a deeper analysis of core concepts is Geschichtlice Grundbegriffe 1-8 (2004), a reference work I return to again and again. Note that despite its title it comprises the intellectual history of all of Europe, from Antiquity to the Modern Era.

theoretical approach about the dialectical process which has been presented in another book.[3] I regard dialectical, contradictory, processes as a core of the complex matrix that shapes human history.

And now a short conceptual preview, as the study is meant to cover a multifaceted reality, and aims to be complex. I use "sphere" to signify an entire aspect of the human existence. I work with three spheres: material culture; social structure; societal mentality. The intention is to understand a totality, without giving preponderance to any of these spheres. (Note that one could have worked with more spheres.) "System" is a core analytical concept in the theory kit. Systems are thematic-spatial. On the highest level we find world systems, and there are at any given time several world systems (I will come back to this in an instant). Under these we find regional systems ("subsystems" to world systems). Further down there are subsystems of subsystems, but generally I have not considered the more local systems. For instance, a global system may comprise large tracts of Europe, and a regional subsystem may be limited to a part of Scandinavia. All these systems relate to a specific domain of the human condition: agriculture, trade, family-structure, and so on. There are no coherent total cultures, so the systems overlap each other.

Turning from spatial to the temporal, one of the enigmas of world history is the common rhythm: different parts of the world tend to move at the same time and in the same direction (of course Eurasia and America had their own oscillations, until they became united). In the conclusion I claim that the enormous interacting complexity is the most important explanation to the relative unity in change.

References below are few, but I intend to publish fully annotated reports regarding the major agricultural regions (major parts of continents like South-East Asia or Northern and North-Western Europe). I quote myself rather much, because what is presented here in many respects is a summary of earlier research and surveys.[4] I came to these conclusions through extensive empirical research, that is presented in the section about technology.

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[3] Myrdal 2006a.

[4] Jarrick 2020 proposed a number of "big research questions", and I was engaged in how to frame them, but my approach in the present book is different: I try to find the answers, convinced that they generate new questions.

I am basically an empirical scholar, but theory is essential to understanding.[5] The agenda here is to paint the big picture, making broad strokes with a wide brush, and to rise above the empirical level while never losing touch with reality.

World systems and global rhythm

A key concept will be "world systems", *plural*. It should be said at once that "world systems" is not used here as it is in the school of world-systems theory. In world-systems theory, a single global system of trade and contacts is the focal point, though subsystems can exist. The world system, with its core and periphery, is held to organize the whole historical process. (Appendix A has a discussion of this set of theories.)

In this text, "world systems" instead denotes several coexisting and overarching systems, pertaining to specific aspects. Another way of expressing this particularity, but regarding it as part of the totality, is to describe it as a specific sector. I will use both aspect and sector. The main point is that world systems in the theory kit always concern something specific.

The relationship between core and periphery is not a major issue for the theory kit, as I regard all the regional systems as engaged in a constant flow of influences and none can be regarded as the most important or typical. (I do not deny that the core-periphery dichotomy could be interesting in some cases, such as in an analysis of an empire.)

I work with diverse overarching systems, such as agricultural world systems or socio-political world systems. These have only a few features in common and they could exist for a very long period. In fact, they often grow stronger over time.

I want to underline that from now on a *world system* in this text denotes a system referring to a specific phenomenon, and for every phenomenon several such world systems existed. The world as a totality can of course be studied as a single system.

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[5] Many world historians have never been down in the dungeons; they have not seen an archive or an archaeological museum's store from the inside. We who have spent thousands of hours in these places should not shy away from that. It gives us deeper understanding of source-critical problems without denying that "generalists" can have interesting ideas and suggestions.

In the theory kit, the globe is in focus when discussing the temporal aspect, identifying large and concomitant changes over large parts of the world, labelled *the global rhythm*. Explaining this rhythm will be a theme.

To use these concepts in this way is not totally unconventional; world agricultural systems are one example. The novel idea is to use this world system concept for a number of aspects of world history (sectors of the totality), where "world systems" denote a specific aspect and not something very general such as "civilizations". They also always encompass only a few generalized elements. I will use them to understand agriculture, socio-political systems and mentality systems, but this approach to analysing world history has much wider applications – and in fact we can find it used in scholarly understanding of world languages, and so on.

How it started

One part of this work is an explanation of agricultural systems, the other is an interpretation of world history as a whole. The former grew out of my interest in agricultural history, the latter was a result of a long struggle with the philosophy of history. Hegel bowled me over in my early twenties. Although I initially read Hegel to understand Marx, I have since often returned to Hegel for inspiration (though I do not consider myself as a Hegelian).

First, I wrote about philosophy of history for my own sake but eventually this resulted in a book whose title translates to "Contradictory Thinking in Practice" (*Motsatstänkandet i praktiken*). The title describes the leading ideas (I return to this below in the section on human particularity and Appendix E). I formulated my own notion about the dialectical process, a process which I consider fundamental and unique to human history. I wrote two more books in the same vein: one on methods in science and the humanities and the other about the future, aimed at applying the theory.[6] Together they form my "theoretical trilogy".

The book about contradictory thinking in practice was not particularly reader-friendly, and to facilitate reading, the text was stuffed with examples meant to illustrate different parts of the theory, one such example was about world systems in

[6] Myrdal 2006a on contradictions, Myrdal 2008a on the future, Myrdal 2009b on methods.

agriculture. A close friend decreed this was a lousy description of agricultural world systems, and I agreed. We decided to work together with some friends to try and do it better.[7] I spent a long time, too long, collecting and organizing data and the project was extremely delayed, for which I blame myself. When my part was on the verge of being finished, I thought it needed a theoretical introduction, which was meant to be short and mainly about categories.

The writing of an introduction to my (unpublished) manuscript on Eurasian agricultural history sent me on a long tour, stretching over most of human history – which is the present text. It is a sequel to the book about the philosophy of history but not an abbreviation. Instead, it is an independent work, focused on some major trajectories in human history.

Outline

The text begins with some premises, including the human ability to think what is not, which, along with the Rule (see below), formats human history. Then comes a part of the text on the generic facets of systems and systemic change. In the main body is a long section about the material culture in relation to agriculture, and another long section covers expansions and stagnations that cause cyclical development. This is followed by a chapter on the social structure to deepen the understanding of how crisis could lead to a reorganization of society. The following chapter is devoted to the history of mind.

The human condition, the prerequisites for human existence, and the human modality, the mode in which these evolve, can be rephrased to underline humans as agents. In many respects, what is presented is the result of my interest in the history of the people, the broad masses, and their role throughout history. Material and immaterial culture are both of crucial importance, and a term used here for this combined collective action is the *human spirit*.

Many of the general principles laid out below may seem unremarkable, but elevating them to a conscious form, and thus opening them to scrutiny, causes a metamorphosis, revealing they are not only crucial, but also to some extent

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[7] Mats Widgren is project leader for Mapping World Agricultural Systems.

extraordinary. Sometimes I feel that my behaviour, towards myself, is like a four-year-old kid endlessly asking "why?"

World history

My venture connects to the world history movement, and the upsurge for this is an intellectual conceptualization of the planet as a single entity with shared problems and an insight that these are a consequence of the long history. Occasionally the future will be remarked upon, but exploring the problems facing humanity is not the main issue here. (Appendix D has a few additional comments on this topic.)

I use world history and global history as synonyms, with an emphasis on *world* as being more of a totality, so global history could be confined to a large spatial portion of the whole, such as all of Eurasia. Some scholars regard global history as the history of globalization per se, a distinction not particularly useful to my investigation.[8]

The region included is Eurasia over the last two thousand years. I have excluded Sub-Saharan Africa and the Americas before 1500, because knowledge about early agriculture there (and other topics) is necessarily based almost exclusively on archaeology.

I started with three indisputable facts about agricultural systems:

+ On a regional level, agrarian technology is clustered into *technological complexes*.
+ Most regional agricultural systems are organized into a few *world agricultural systems*.
+ Change in most of Eurasia, and after 1500 in the whole world, followed a *common rhythm*.

These were combined with a conviction that agriculture is only part of a larger whole, and I had to carry out a multifaceted analysis. Of some help was my multifaceted interests as a scholar. I have the history of agricultural technology at my fingertips, but have also researched many other topics, such as peasant revolts, images in

[8] See articles by Pomeranz & Segal or Weinstein in Northrop 2012.

mediaeval manuscripts, proverbs, household items, folk religion, travelling, peasant diaries, etc. I love primary sources. It is a pleasure to search out documents, study archaeological finds and contemplate the meaning of images. This keen knowledge of many primary sources facilitated broad sweeps across secondary literature.

Although nearly obsessed with delving into sources, I must declare: I love details but not Bongo-Bongoism.[9] I am fascinated by the ingenious ways people have solved problems throughout history, and try to get so much information about everyday life that I feel I can nearly step into the past. But lacking a theory, facts will run through your fingers like dry sand when you try to grasp it. Theory is needed to organize discrete facts in relation to each other and to understand them in their totality so that you can go back to the empirical data and research them more fully.

The Bongo-Bongoist objection, "You say this about general patterns, but, you see, the Bongo-Bongo tribe do it differently", makes analysis impossible. Every survey will show variations and exceptions. This not an argument against theory; instead, such differences must be built into theory. Bongo-Bongoist scholars can present useful data concerning the tiny corner into which they delve, but their argument against general theory has to be rejected.

On the other end of the methodological scale, we find those with a lax relationship to sources. These are often dime-a-dozen books, but occasionally one can glean a few interesting ideas from them too.

This text is partly an emanation of my theoretical trilogy, but the entire theory kit is also based on a number of surveys, some of which are not yet published.[10] In world history, secondary sources necessarily provide the basic source material, and like all sources they have to be treated critically. One method of verification is to check some of the studies based on primary sources. Searching is another major issue: old methods, working in libraries and following traces in the bibliographies of relevant books, now have to be combined with the Internet. In fact, online resources make

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[9] I have the term originally from Lewellen 2003:15, and from talking with anthropologists. Wikipedia has some informative articles about the historiography of "Bongo-Bongo", notably that it also has a colonial pejorative ring, which is not my intended meaning here.

[10] A main vein of the unpublished texts comprises reports on the history of agriculture in the main parts of Eurasia, and also a study of popular rebellions in Europe and China. Some minor studies will be included, such as a study of rural class struggle in Europe and China.

a survey like this more feasible than ever.[11] But without keen source criticism, these resources will be misleading.

When I started working with world history I was flabbergasted by the lack of methodological discussion. You rarely encounter a book on world history where the first chapter is devoted to methods and sources. Sometimes there is a discussion of how to avoid Eurocentrism, or rudimentary discussions about units of comparison, but we are far from any source critical movement in world history. Using secondary literature produced by colleagues as sources is practically never discussed.

As a mediaevalist I was trained in hard source criticism, and one method used was to set up descriptive catalogues (of manuscripts, etc.), which allow for total transparency so that other scholars could "repeat the experiment". I developed a method related to this: "the Iceberg Method" for world history.[12] The basic idea of this method is to take on the overwhelming amount of information by selecting the most salient cases and discussing them in detail, assuming that they represent all the smaller episodes. Such an approach also allows a comparison across periods and regions.

Methodology for world history deserves extensive treatment and although I have discussed this issue in several works, my plan is to present a longer text on methods in world history.[13]

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[11] Wikipedia is a wonderful tool and a striking example of a collective intellectual endeavour. (I donate money every month, and more people ought to as well). We humans can be proud of this. However, no serious scholar should use it to cut corners when exploring a subject. Significant books still have to be read. In the present text, I have chosen to pass over references if the relevant Wikipedia article is of reasonable quality with further references. Google scholar and a number of the many other available databases are also quite useful tools. I am especially fond of anthropological databases like HRAF (Human Relation Area Files).

[12] Myrdal 2020b explores the Iceberg Method, with agricultural treatises as an example.

[13] Myrdal 2009c is a sort of practical instruction to world history research, Myrdal 2016 exemplifies some methodological problems.

People's history

All humans in all regions take part in the shaping of human history. The masses are not the stage on which the drama is performed, they are important actors. Individuals have their role but only if aligned with the main tendency of the time. Throughout this piece, the history of the people is regarded as a major part of and a driving force in history. I will try to turn history upside down repeatedly, in technology, in social transformations (such as rebellions) and in the history of the mind.

Another theme is that hard repression seldom drives humans forward in expanding production (according to societal goals for production). Hard oppression in most cases eventually damages legitimacy and hinders the production of goods. In the long run, it also impedes more intricate social complexity.

The masses is a major driving force in history – if we regard the happiness and welfare of the masses as an ultimate goal. [14] This idea of the people as a driving force in history will, however, only be an undercurrent in this text. This hypothesis is so complicated and contradictory that it deserves a text of its own – and it is doubtful that I will ever write that text.[15]

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[14] This also implies that I am sceptical of attempts to reconstruct Gross Domestic Product (GDP) for historical periods. One period's production is another period's leisure or even destruction. With a variable production concept, the overarching goals in a society become clearer. Long-term development can better be studied with single factors. Time budgets for different periods would also be revealing, and with this I go beyond the labour theory of value to a life theory of value (or rather a collective time allocation theory). This was touched upon in Myrdal 2008a 133. Sorokin & Berger 1939 is an interesting attempt in this direction.

[15] In Lind & Myrdal 1981, we tried to grapple with the idea of people as a driving force in history. I still adhere to parts of the main thesis, for instance regarding oppression as basically obstructive of positive development, but I have changed my mind in some respects. The text from 1981 is rudimentary and much is left unexplained.

Premises

Human particularity

A central assertion is that humans shape their environment (including themselves) in a way that no other animal comes even close to doing. We are animals, but very particular animals, and this particularity must be considered to understand how natural history crosses over into cultural history.

Numerous characteristics have been declared distinctive of humans: immense capacity for learning and development of a variety of derivative needs; use of symbol systems; a highly developed sense of self and so on. Practical tasks like toolmaking have been put forward as crucial and an alternative interpretation is that sociability and interconnectedness between humans are at least as important.[16]

These characteristics are all relevant, including the ability to make tools, and they form an integrated whole, making humans an exceedingly specific (and successful) animal. Showing that some other intelligent animals can learn a couple of tricks is interesting, but does not reveal much about cultural history. I will not delve into details of genetics, which is a scientific genre of its own and one in which much is still unknown or seems to be misinterpreted.[17] Here, the focus is on what can be

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[16] The toolmaking animal was a dominant idea for a long time; see for instance Childe 1981 13–24. When I was very young and planned to be an archaeologist, Childe was one of my idols. His ideas, and those of others, that humans are the toolmaking animal, steered my interest into material culture (and I spent some time digging in the trenches). For theories about sociability as decisive for human development, see Dunbar 1996 and many followers.

[17] My guide into these subjects is Lars Werdelin (with whom I have co-authored on medieval osteology), and among scholars recommended by Werdelin are; Steven Mithen (1996) and Jonathan Kingdon (1993). Much effort has been devoted to understanding the Neanderthals and I have been guided by scholars like Mellars (1995). DNA research is advancing so rapidly that premature conclusions are an obvious risk, but these results combined with the flow of new discoveries will eventually give us deeper and surprising insights. The state of the art can be followed, by us non-experts, in relevant Wikipedia articles.

inferred from cultural history. I begin with core characteristics: the human ability to imagine and how this has been transformed into action.

A fundamental particularity is the combination of two faculties: first, humans can imagine that which does not exist, and second, they have the potential to act consequently. This combination of brain and body gives people the ability to combine creativity and practice. The ability to imagine what could be and a body capable of putting some of these ideas into action gave humans an advantage before other intelligent beings, such as the dolphins, which can (probably) think somewhat like we do, but cannot transform thought into action to the same extent. In Appendix F where: *The human capacity to imagine what does not exist, to think into being*, is explored in number of stanzas, forming an ode to human history.

This combination triggers a feedback process in which conscious action transforms the mind. Creative thinking (which is not just the size of the brain, though this is important) and a feasible body (not just the hands, although they are important) steer human history into a dialectical existence, a dynamic that evolves in contradictions. Every thought-action is met by other thought-actions. The famous tripartite scheme: thesis/antithesis/synthesis is a very simplified way to explain this.

A complex set of capacities develops from this human particularity, of which I mention only a few that are important to the text as a whole. First comes the obvious one of language, which is followed by brief remarks on two others.

Language. A distinctive capacity for homo sapiens (and our extinct closest relatives) is an elaborate language that facilitates the transmission of knowledge across generations, but there is something more to it, related to the ability to imagine that which is not.

Steven Mithen pointed to the fluid mind as a biological uniqueness, since humans think in metaphors and mix domains like no other primates. Consequently, the language of homo sapiens is different from the tongues developed by other human species like the Neanderthals, whose language presumably had an enormous vocabulary, with specific terms for everything. Human languages are so drenched in similes that our thinking becomes fluid and metaphorical. This also reduces the number of specific words a human has to master, as all words are developed from and overlap with other words. We think in allegories, a floating thought process that opens the mind to totally new ideas and wishes. It also helps us tell others how

these ideas could be put into action and, lest we forget, this thinking shapes stories and fantasies that are never meant to lead to any action at all.

Homo ludens: the playful, experimental animal. Humans are among the few animals that play throughout their lives. Many animals have a period of playing as juveniles, and in that respect humans are lifelong juveniles, which implies that they not only can but want to learn new things as adults too.

Consider how humans spend their leisure time. Much of it is spent just relaxing, but this is accompanied by many physically or mentally challenging leisure activities. (The tendency to take things to extremes is part of being human and even the most tranquil activity, such as chess, can be taken to obsession.) Play often mirrors society at large, such as the English medieval long-bow competitions, training presumptive soldiers, or youngsters playing computer games today, creating future software specialists.

Specialized skill. What is seldom thought to be something strange is the extreme variation of human skills. Humans have not only developed and mastered techniques over the millennia, but have consequently become proficient in an enormous number of professions. The level of perfection humans can achieve is stunning. A bowman can hit a target a hundred metres away, an ironworker can gauge the temperature from looking at the colour of the melt. By repeating the same specific action and the related thoughts thousands of times, humans can master all of these diverse tasks. We are still inventing utterly new challenges and mastering them to perfection.

The human capacity to thrive and develop under diverse circumstances is also amazing, and to a great extent this is about formatting the mind in relation to the environment. Hunters read their surroundings and conceive themselves a part of nature; a hunter tracking a prey steps into the mind of the hunted to understand its movements. As plants and animals were domesticated, humans consequently had to tame themselves and start to live at the command of the few species selected. Ongoing self-domestication is a part of the plasticity of the human mind.

For instance, the whole IQ test is time-bound. It measures the ability to read symbols, not intelligence per se, and is specific to our time's focus on reading symbols. The increase in average IQ (the Flynn effect) is a measure of how humans adapt. The desire and capacity to become skilled is a foundation of technical change as well as the social division of labour.

Openness to novelties and the capacity to focus intensely on invented skills are just two of the many attributes following from human particularity (not least the fluidity of imagining what is not).

Human are social animals, capable of building large social structures. This can be related to the capacity of imagination, as it gives us the ability think and feel like someone else – to step inside another person's inner world. Sociability, and also the wish to hear stories about others, real and imagined, are corollaries. This is accompanied by the entire universe of fantasies, images, music, etc.

All of this conscious action follows specific regularities. The notion that many individuals who are striving to reach diverse goals ultimately reach unintended consequences does not explain much. We have to analyse how this complex mass of conscious behaviour forms an entity.

We can identify regularities so strict that they could be labelled "laws" of human history. Natural law is a metaphor taken over by natural science from the humanities and, by the same token, it can be taken back and modified to human conditions. A law can be renegotiated, or to phrase it differently: even the firmest regularity in human history can be transformed. That said, I will not use the phrase *laws in human history*, but prefer to talk about *regularities* and *rules*.

And first among them, "The Rule": which rules over them all, finds them and binds them.[18]

The Rule

In transforming nature, humans are bound by strict limitations set by nature and by other humans. Technology is about how to overcome these limits: push them aside; exploit them; find ways to bypass them and so on. Everything is subject to an extremely important rule in human history, which I have labelled "The Rule": *The number of solutions to specific problems is restricted*.

[18] Yes, I allude to Tolkien, but this is merely a nod to Sauron's infamous ring because The Rule does not enslave other theories – it simply exists to be observed and taken into account.

There can be several solutions, and variations of them could be considerable, but only a few are doable, and in a few cases, just one. In the material sphere, people solve similar problems and develop similar adaptions, arriving at similar solutions. Yarn can only be spun in a few ways, and these have been developed independently many times across the globe. We find the same pattern again and again: humans select among a few possible ways. (We shall return several times to the limitation of possible solutions, and references to The Rule will be ubiquitous, for instance in the section on technology.)

The restricted number of solutions to specific problems also steers how social systems are built. In diverse societies people tend to find similar ways to handle exchange, justice, mating, etc. I am aware of the differences between how technology and social contacts evolve, and this difference and dissimilarity in overall change shapes a (dialectical) dynamic. Even in the intellectual and spiritual sphere of human history the Rule can be applied, as humans through the epochs throughout the world pose similar questions and give parallel answers. However, the mentality sphere is more fluid and varied than other spheres – I will come back to that.

Main spheres

The cultural history of homo sapiens can be regarded as evolving in three interrelated spheres. First, humans utilize and transform nature in production. Second, humans meet other humans in social contacts. Third humans face themselves in ideas, beliefs, etc. I elaborate upon these spheres a little bit more, where innate contradiction is emphasized with "humans encountering," and then also include a possible fourth sphere:

Humans encountering nature, is *the material sphere*, which also could be labelled material culture. Production has a slightly different meaning, because what is considered production is a social value judgement.[19]

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[19] Many pre-industrial societies regard prayer conducted by specialists as a crucial activity upon which the existence of the whole group depends, something perhaps most of us today do not believe. Correspondingly, much of what is considered production today would probably be regarded as completely unnecessary by someone from a pre-industrial society.

Technology is the means by which humans handle problems, and here this term is reserved for the material sphere (without denying that it also can and is used for the other spheres).

Humans encountering each other, is *the social sphere*, which includes all contacts from the very intimate to the formal and even the hostile. The ultimate goal of much social activity is to organize and facilitate production, but social interaction is about so much more.

Humans encountering their inner selves. This sphere comprises perceptions and cognitions seen in a societal context. The individual has an inner self, which takes shape in a specific society. A society has a *collective mentality sphere*, separate from and interacting with the other two main spheres. A short digression is needed as English does not have an obvious label for this.

We need a term for an entity embracing all thoughts and feelings prevailing in a society. Non-material (immaterial) culture would include the social sphere, which is not the intention. Mind can be used in this all-embracing way, and then we have to avoid the mind-body dichotomy. Mental could have a broad meaning of intellectual, spiritual, emotional, conceptual and so on and so forth. French scholars use "collective mentality" or just mentality, but Anglophone scholars are more reluctant to use this term.[20]

I consider social mentality as the ways of thinking, overarching and permeating all other intellectual domains in a society (religion, philosophy, and so on). I thus use two parallel terms: the *history of mind* and *the mentality sphere*.[21]

Intellectual history is a subject area in its own right, but its focus is on the literate upper class, and the broad masses are unfortunately excluded (as they are in philosophy). This is a shame I think, and has hampered much of our understanding of how rational thinking evolves.

Spirituality is something else, and can be regarded as a subsection of the history of the mind, with a focus on religion, mysticism, etc. *Spirit* again is much more than

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[20] For a more restricted use of this term, see Burke 2004 94–99 with different suggestions, and who also remarks that the British have been slow to accept this term. I return to this below in the chapter on the history of the mind.

[21] Typically, "des mentalitéts collectives" in Braudel's brilliant grammar of civilization is translated with a blunt: "ways of thought" in the English translation, Braudel 1987 53, Braudel 1993 21.

a mentality, where the whole life and power of human striving and endeavours are included.[22]

History of needs and wishes. One major aspect could form a fourth sphere: the development of needs. At first it may seem like consumption should belong to the material sphere, and this is the case when it comes to basic needs. But animals belonging to the human species have, from the very beginning, craved so much more. Wants are invented, and thus insatiable if not restricted. In my earlier theoretical trilogy, the history of needs was essential, especially in the book about the future.[23] Here I set it aside (though return to it with a short section in Appendix C).

The three spheres are different. The Rule is inevitable in the material sphere, which is the root of much ingenuity. A strong system of defensive mechanisms distinguishes the social sphere. The history of the mind is more fluid as a totality, even if a particular paradigm might be rigid.

Long-term trends

Long-term trends, with ups and downs but still running along some linear scale, are a part of human history. By analogy, such trends have been compared to evolution in biology, and the increased social complexity has been described as an "evolution." A problem with this terminology was the postulation that evolution also meant progress, and that less complex societies were seen as inferior (more primitive), an idea which was eventually rejected by many scholars. However, a value judgement is not the same as an interpretation.

Few deny that trends exist and I do not consider the criticism about progress, though justified in some respects, a substantial objection to the inclusion of long trends in this theory kit. I regard the term "evolution" as a synonym to long-term trends, with the proviso that human cultural evolution differs from biological evolution: it is not heritable and selection processes are different.

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[22] "Fighting spirit" is an idiom that I believe puts too much stress on competition. Cooperation is more efficient, and perhaps "striving spirit" could serve as a better, or at least supplementary, concept.

[23] On the history of needs and wishes, see Myrdal 2008a 109–142, where I introduce the concepts of "wish-space" and "possibility-space" where the former grows faster than the latter.

Although acceptable, the term cultural evolution will not be used here because it could be misunderstood.

Another concept that would be handy to use is "meme," to refer to cultural elements that spread from person to person, but this term is so infested with ideas of cultural units being the same as "genes" in biology that it has been made unusable. Cultural items – ideas, styles, and on a more detailed level gadgets, methods and stories – are not transmitted as fixed units, but as consciously shaped. To talk about the reshaping of cultural items as "mutations" is totally misleading. Humans decide and change their needs and solutions to an extent not comparable to any other animals (not to mention all other living things). Cultural development is much more efficient than biological evolution. Mutations occur although extremely few are successful, but in human society a process of trial and error makes many inventions into innovations. Selection processes are also totally different, as already mentioned.

Two major and mutually related long trends in human history are a growing population and improved land productivity. These trends have expanded the scale of human society, but everything can change when steered by consciousness. In the future, humans may strive to achieve a constant or even stagnant population, and a redefinition of production may include creating sustainability (see Appendix C).

Another long trend in material culture is increased labour productivity, which allows a larger share of the population to work with other things than primary production, and to work with other things than production of physical products. Greater efficiency is thus a necessity for a more complex and diversified society.

A salient evolutionary process in the social sphere is increased complexity. More people are engaged in contacts, both direct and indirect, and in more precise and diversified roles. As humans have not changed much biologically, and thus have limited capacity to handle this increased complexity, the trend is counterbalanced by an ongoing facilitation of contacts, especially in contacts with strangers.

Perhaps it is superfluous to mention that large parts of social interaction have no obvious evolutionary trend, such as love, friendship, hate, etc. Yet these compartments of human modality reflect society as a whole and so a history of love, for instance, reveals much about the whole society.

A longue durée

The term "longue durée" is normally used just to denote the long history, separated from events. It was coined in protest against old-fashioned historians who believed that history was a long row of events occurring stochastically. Progressive scholars in France wanted to underline that long-standing structures steered the flow of events.

Many in the French Annales school emphasized long time perspectives but Fernand Braudel struck a chord when he explained that historians have to work at three different planes: one being the history of events; another being the plane of episodes like the French Revolution; and finally, the third plane that considers phenomena measured over centuries. The last mentioned is often labelled the "longue durée" and today it is taken for granted by nearly all historians that the long history is also crucial to the history of single events.[24]

In this text, the term "longue durée" has been adopted and given a different and more precise meaning.[25] "A longue durée" in the theory kit covers a very long period, an eon, in human history with a specific pattern of expansions and stagnations and also with distinctive set of world systems. The longue durée in focus here goes from the centuries before the beginning of the Common Era until industrialization.

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[24] This is explained in his "grammar," Braudel 1987:66–67 (English translation 1993:34–35). In his two-volume book on the Mediterranean he has a long discussion on this in the introduction, Braudel 1972–73: 20–22, but in the concluding chapter he mentions that dozens of different measures of times could also have been used, not just the three-part division he worked with, Braudel 1972–73:1238–1239. The first edition of the book came in 1949, and the conclusion was added in the second edition in French in 1966.

[25] The term as it is used – a long period – is so diluted that it has lost any meaning, and that is why I consider it proper to give it a more precise denotation, which still is very close to how it is normally used.

Systems generally

Systems

Obviously, everything is organized in systems, where elements interlock in a grid and the whole is more than the sum of its parts.[26] This notion is of interest only on a very generic level. Accepting the systemic perspective is not to deny what is coincidental, but a demand to grasp how systems function.

Incremental change eventually transitions to systemic change. I am tempted to use the quantitative/qualitative dichotomy here as a way to understand this switch, from an increase in quantity until a change to a new quality of the thing becomes inevitable. This is Marxian-Hegelian terminology, but both in philosophy at large and in ordinary language, these terms are used differently, so I will try to avoid them. The reason they are useful is that they emphasize a single and measurable phenomenon, and how a change in quantity eventually confronts, and often leads to, structural change.[27] Not all phenomena can be measured in quantities, but those that can are often good proxies for the others.

Categorizing on different levels

Delimiting is a must. It is tempting to define a system through one essential element, and the subcategories by other unique elements to arrive at a logical hierarchy. This is an acceptable method, especially if a particular aspect is under consideration, but

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[26] I will use "elements" and "features," to denote parts of systems.

[27] Hegel held this dichotomy to be only a first and primitive step to understanding a "thing," as it focused on measurability, which, for my purposes, is why it is palatable. I also want to state that I do not endorse comparisons with natural phenomena, such as water turning to ice. Qualitative change in human society is utterly different; see Myrdal 2006a 85–86.

it does not mirror reality, and the obvious simplification should not be downplayed if this type of categorization is used.

I have chosen another path, where the essential elements are identified and an imprecise outer delimitation is accepted. In the next chapter on material culture and technological systems, the method of delimiting a system is explained in greater detail, with only some general principles indicated here.

To differentiate between different spatial levels is a crucial part of this theory kit. A system restricted to a smaller area can have more features in common than do systems covering a larger area, and consequently regional systems are constructed of many elements but world systems are defined by fewer, which has some implications.

A regional system with more features in common can be analysed as such within that specific sphere, for instance as technology alone, but a world system must be understood by relating it to other systems. A specific regional system, of course, is related to systems in the other spheres, but nonetheless it has to be analysed according to its inner logic before being related to systems in other spheres. On the world system level, the common elements are so few that one cannot understand how they are held together without including relations to systems in the other spheres.

For instance, an agricultural world system has to be related to food habits (dietary regimes) or family structures as well as to other systems in the same material sphere, such as industrial production. World systems are intrinsically intersectional. A regional system has so many related elements; for instance, in an agricultural regional system, ploughs–harrows–field system–weeding–manuring and so on. The regional system has to be understood as such before being related to other systems.

The few elements in a world system are of a more general character than those in a regional system. To again use agriculture as the example: world systems are not constituted by specific methods and tools as they are on the regional level, but by general traits, such as wet-rice cultivation or the degree of integration between arable farming and animal husbandry (livestock farming).

These wide-ranging elements bend the regional systems, though we should not forget that the world systems are constructed of regional systems. Consequently, elements that make a world system must exist in every subsystem (regional system under the world system). From this follows that some regional systems will not be included under the world systems.

A further consequence is that world systems are less prone to systemic change than regional systems. Their few and generalized elements endure, even though much of their regional systems are transformed, which implies a certain path-dependence. For instance, a wet-rice system, with rice consumption as a food habit, is inclined to raise rice production. For long periods the rule is: the more regional systems change, the more the world systems stay the same.

I will return to the complex interrelations between all spatial levels and all different systems in the concluding chapter, covering a "totality."

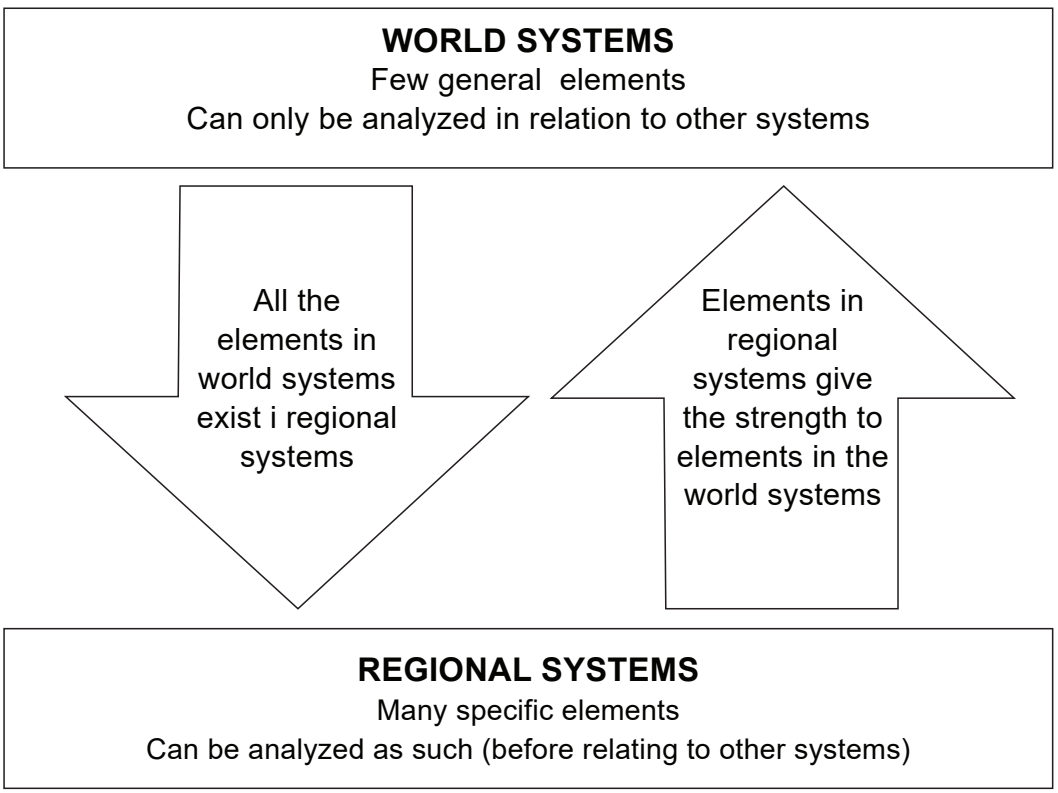

Figure 1. Spatial levels

Diffusion and world systems

Diffusion can be defined as how cultural elements spread along chains between individuals and groups. They spread with influence streams, shaped by trade and other movements of people. This can be a "jumping" spread, but only via direct contacts, for instance between a number of distant ports.

"Stimulus invention" assumes that general ideas can instigate specific new inventions in distant areas. General ideas, such as the use of the wheel, can be of major importance over wide areas and materialize in a number of several specific ways that wheels were used. Most of Eurasia was a wheel culture, but not Sub-Saharan Africa or the Americas, but that is another story. I have never come across a "stimulus invention" and I doubt they exist.[28] General ideas connect to inventiveness on the local and individual level, resulting in a multitude of diverse and parallel innovations.

Single inventions are successful and spread world-wide. They could be technical, such as the compass, or belong to the mentality sphere, such as the Alexander legends (existing in many variants over Eurasia), and they were all included in different systems.

The spread of systems is underdiscussed in the scholarly discourse on diffusion.[29] A system takes shape when a number of elements are united into a grid, and when such systems spread to wider spatial areas this can be described as system-diffusion. All systems are formed and start somewhere, often over a quite large area in one push forward. Further spread can occur in spurts, often related to transformation

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[28] In Myrdal 2020a I discuss diffusion, especially how items of material culture spread. One of my examples concerns the wheelbarrow. Basically, it is a stretcher with a wheel at one end (the Chinese one-wheel cart is a different vehicle). On a general level, this is related to the extended use of wheels in a culture (cf. Bulliet 1990 about how the camel replaced wheel carriages in Central Asia). There is no need to assume that some general idea of a-wheel-at-the-end-of-a-stretcher floats around waiting to be materialized in diverse parts of Eurasia (which has been assumed). Instead, this invention is so simple that it has been invented (and forgotten) many times over. The wheelbarrow became important (in China and later in Europe) when it could fit into a system of large-scale construction. Industrial production lowered the cost, so that wheelbarrows could be used to a much greater extent and by everyone.

[29] For a short but interesting discussion, see Barnard 2000 47–57. Diffusionists argued that whole clusters of features only spread by migration. In my opinion, both single items and whole complexes could spread. Feudalism spread in the High Middle Ages in much of Europe and various agricultural systems spread because people changed their way of cultivating, for instance from swidden to wet-rice.

periods of many regional systems at the same time, but also by a gradual inclusion, typically when one system has acquired a higher land productivity and thus a larger population density. More people generally beat fewer people.

A misinterpretation is that the region where the system first emerged continuously remains the core from which further novelties are spread. In reality all systems evolve in a pulse between the more central areas (being in the middle) and those at the fringe. This also implies that no part of a world system is "the model" for the others, the typical. The further spread of a system leads to greater variation, where all variants are important to understand the whole.

Now turning again to the question about the difference between regional systems and world systems, but from a different angle. As pointed out, a characteristic of elements in a world system is that they are of a generalized type. A dominance of more general elements makes a system more adaptable, which is a reason why a world system can overarch and be integrated into many regional systems. Being more flexible, they can survive dramatic revolutions in the regional systems.

The relation between overarching systems and subsystems, from a geographical perspective, is also that the world system influences and bends subsystems in the same direction. Features on world system level permeate all the regional systems. At the same token the regional systems give the world system its strength and survival. If the regional systems abandon the elements forming a world system the latter eventually will fade away.

Another important characteristic is that world systems with their fewer constituting elements are in closer interactions with systems in the other spheres. This implies that causes for their spread are more multivariable (than regional systems concerning an aspect). Let us take the agricultural world systems. Besides pure technological factors (one system being more land-efficient in producing food), also socio-political factors play a role (such as state support for an agricultural system) and even mentality has a role (such as food habits related to religion). A complexity of different causes interact.

World systems diffuse to the point where they can be integrated with diverse regional systems or until they meet other world systems. The spread is always multivariable, which has to be taken into account when they are defined and delimited. World systems in different spheres do correlate but their spatial distribution does not concur. For instance, the European system with integrated

livestock and arable farming has been related to a family structure where women played an important role, but this family structure has a partly separate geographical distribution.

A short exemplification

I repeat the line of argument. Components in a regional system are more numerous and more specific than those in world systems. The few and broad elements in world systems are more persistent over time, permeate the regional systems they convey, and bend them. This can only be fully understood with concrete examples, which I take from my backyard: Sweden.

Agriculture. Eastern Sweden formed a regional agrarian system where efficient ards and a two-course rotation were important elements, quite different from the system prevailing in Northern France and Southern England with wheel ploughs and three-course rotation, but both of these regional systems were included in an overarching system of mixed farming, where the close interaction between livestock and arable farming was a general and basic feature.

Sociopolitical structure. Peasants in Sweden enjoyed strong social, economic and political position. Serfdom did not exist. The regional system was thus different from Northern France and Southern England, where serfdom was common until at least the Late Middle Ages, but both regions were part of an all-European feudal system where transferred power was a core element (more about that in a later chapter).

Systems defining themselves

Elements in world systems can be adapted to and influence diverse regional systems, which is fundamental to understanding how world systems are formed. But in the theory kit, one explanation is never enough. Geographical distribution cannot be understood by diffusion of systems alone; we also have to consider why these easily adaptable systems did not spread, and besides factors relating to environment, there is another dimension to non-spread on a systemic level in all regional systems.

All systems shaped by humans are consciously defined against other systems. They meet and are separated.[30] Every group perceives itself in relation to other groups (just as people see themselves in relation to others). At first thought it would seem as if consciously delimited systems would be strongest in the social and mentality spheres, but working methods as well as dietary regime or traditions in housebuilding could be absolutely essential to how a group perceives itself.

The reader may be reminded of Freud's catchphrase: the "narcissism of small differences," where groups emphasize minor dissimilarities to mark disconnection from adjacent groups. These small differences do not have a systemic role and the "narcissism of big differences" is much more significant.

Let us look at how the Chinese came to abstain from milk products, which makes their culture distinct from the nomads on the northern steppes. Lactose intolerance is not the sole, or even most important, cause, since milk can be processed. Abstaining from milk products has a long history in China that is related to the agricultural system with a restricted number of cattle and few sheep. But this food habit became finally and firmly established after the fall of the Yuan (Mongolian) dynasty in the second half of the 14th century. Abstention from milk and dairy products in Chinese cuisine is thus also related to a cultural distancing from the nomadic way of life.

Could this tendency of detaching from other groups be significant to world systems? The "narcissism of big differences" is obviously rather seldom at hand, because people were not aware of behaviour and customs in distant regions (in recent times it is different, of course). One has to look at it from another side. To most people, their own system seems obvious, the only possible way to live. If something that seemed awkward did appear, the obvious-system would be resistant and such a novelty would soon be forgotten.

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[30] In Hegelian terminology we have to separate between units that simply exist (in itself, "an sich") and those with a conscious relationship to other systems ("für sich"). Marx used this to explain how class-consciousness gradually emerged among the proletariat and transformed a suppressed class into a force in history. In the class struggle, they now stood as a consciously formed class (für sich). The Hegelian line of argument has wider implications and is fundamental to our understanding of how systems emerge.

Change within systems

Change is inevitable in a human society. It could appear that some societies and periods are immersed in total stagnation, which is a biased notion as we compare with societies with a fast pace (as our own time). Only very small and isolated communities experience total stagnation, or even regression, and even in these cases it could be a conscious reaction to difficult circumstance where more complicated technology did not pay off any longer, or where the community could not sustain specialists. (Tasmania is often mentioned as a typical or even extreme example.)

Incremental alterations are the most common, and these are intra-systemic. They often tend to strengthen the system by enfolding its possibilities. Amendments were made by individuals, but no one can step out of his or her own time. People take ideas floating in the air to make them feasible. Not only possible solutions, but also the urgent problems, belong to the spirit of the time, and often several persons worked on similar challenges and tested possible solutions one after the other.

Most novelties are of minor importance and ephemeral. They are diffused to and accepted by only a few. Some are successful in the sense that they are generally spread and lasting. Such innovations became parts of the impact chains, the world-wide flow of influence. In other technological systems they could be of importance or become suppressed elements. One should not underestimate the role of the "minor" novelties and innovations functioning as a lubricant for the whole system. In a complex and multifarious system, all minor solutions shape an essential dynamic. In fact, nearly every person makes such small adjustments and amendments.

Systemic change

Piecemeal change dominates but structural change is the way to go from one stage to another: a new totality is formed. At first sight, conversion from one system to another may seem to be something of an enigma. If a system is well adapted to the environment and is solving the most urgent problems, the logical outcome would to be an overarching stability, expressed in the famous quote, "We live in the best of all possible worlds," which has been claimed for many epochs and not the least concerning the social structure which is considered to be well adapted to promote

stability and survival. But, human history does not function in that way. All that emerges is doomed to succumb under the force of creativity turned into practice.

A system is a prerequisite for change; without stability incremental change cannot happen. At the same time, the system is a hindrance for fundamental change, as mechanisms will protect the existing structure from dissolving and crumbling into pieces. Structural transformation both builds and destroys in a process which is profound and pervasive.[31]

It is in the nature of the beast that a change from one system to another is not gradual but sudden and often dramatic. A number of elements and relations between them have to be replaced to form a new system, though even a profound change will preserve some parts of the older system. Total destruction does occur, typically when a culture is conquered and wiped out, but even then, traces of the earlier system can exist.[32]

Cycles

The rise and fall of major systems make human history move in cycles, where a cycle ends with transformation. A theory about cycles, with expansions (the emerging phase) and stagnations (the declining phase) must have causes for the decrease in the increase and vice versa. This is not enough; every new wave will be different from the foregoing, often lifting a long trend to a new level. Destruction is restructuring for a new construction which exceeds the limits of the earlier system.[33]

Note that this notion about cycles is totally different from the ideas about cycles with a regular wave length. Such postulations are rather common, not least in theories about world history but also in economics. I consider them strange and in fact merely an apophenia (to see pattern where they don't exist). How should a

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[31] It has some resemblance to the famous Schumpeterian creative destruction, which, however, does not always lead to systemic change.

[32] Place-names in the US are an interesting example – very many of these names go back to native American's names for tribes, etc. Also, a number of technologies belong to this category of surviving elements.

[33] I admit that this is a reference to the Hegelian "Aufhebung": to destroy is to reach a new level – a German pun, and Hegel loved to use ambiguities in language to point out complexities in reality.

constant phase change of say about 75 years be explained? I have never seen any explanation that can be taken seriously. A shock, like the Second World War, can result in a dip being followed by a wave for a period, which then levels out.

A global rhythm

The whole theory kit starts with empirical observations about regularities to be explained. One such is a universal pulse, that we find in the material sphere (population), in the social sphere (political units), and also in the mentality sphere (major changes in how people think).

The strange thing is that in all of the different spheres large scale changes did follow a rather simultaneous rhythm, which is labelled *the global rhythm*. I will return to empirical evidence, but for the moment let us accept this assertion, and contemplate how it could be possible.

Billions of changes occurred simultaneously across the globe in all of the different systems, on all levels and in all spheres. They interchange in cross-influences. They start to "wobble together," which is labelled *interference*. A main hypothesis to grasp and understand the overarching pulse is that what emerges is an enormous interference where changes start to move at the same pace. (I elaborate on this idea after having presented the three spheres in the concluding chapter: "A totality.") This is of course only one explanation, and it has to be supplemented with others. Some are particular for every separate domain, and some regard interaction between two systems.

Walking down into the valley of possibilities

In a valley of possibilities, surrounded by the high mountains of necessity, the actual riverbed of human history meanders. Coming to the end of this general section, where I still stand on a high cliff, with a view of the whole valley, I want to add a few comments regarding this meandering flow of change.

Sequences. The rule about the limited number of solutions affects possible sequences in technological development. Some inventions have to predate others. An obvious

case is the metals where those with a lower melting point were being exploited earlier than those with a higher, for instance copper before iron.

Equally, a limited number of successions appear in the social sphere, with variations. A prime example is the change from tribe to chiefdom and eventually into a state. The anthropological discussion has many moot points, nevertheless it is seldom denied that this historical sequence of social organization existed.[34] This trajectory to larger, more complex socio-political entities could take sidesteps and detours, but looking at the large picture we see similarities between how societies evolve.

Another such basic and generally accepted sequence concerns production, in a succession from hunter-gather to agricultural and then industrial societies. My goal is to present human history in a much more convoluted way, but these large scale sequences most be recognized.

Path dependence. The notion that earlier decisions steer later ones seems trivial at first, but this has a number of consequences. It works on a minor scale regarding each course of events, but here the focus is on the higher spatial levels.

As already mentioned, a new system on a regional level inherits some traits of the older, often being parts of an overarching world system. The relation between world systems and regional systems thus explains a part of why systems follow a path dependence (but also factors in regional systems as such causes path dependence).

Pace of change. Generally, all groups in all periods have the same outflow of individuals with original thinking, and more people will make change occur faster. As the number of people increases, more inventions are made, and specialization means deeper knowledge has the same effect. To illustrate this pace of change in relation to the population I turn to what can be labelled "the Big Experiment" in human history.

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[34] Johnson & Earle 2000 gives a good orientation into the problem. Orme 1981 gives historical depth by comparing to archaeology.

The Big Experiment

Before the next section, when I start to go down into the valley of details, a first testimony is laid forward. Comparative history is innate to all world history research, but controlled experiments are rarely possible. So, comparisons have to be conducted with a strict methodology as we cannot assume that cases are totally isolated. For instance, a remote tribe in New Guinea is in our time integrated in a world economic system, though being at the extreme periphery.

However, there is one case where the entire globe became included in one giant experiment, which to a large extent fulfils the requirements for a controlled experiment. At the end of the Ice-Age a warmer climate caused rising sea-levels, which separated three major landmasses: Afro-Eurasia, both of the Americas and Australia. Nearly all contacts ceased.

Northern Australia and Newfoundland were visited by fishermen but they had very little or no contact with people living on the inland, so cultural influence was nil. Note that this no-contact pattern was not just because the possibilities were not at hand (though advancements in shipping had some influence), but because there was no interest in interacting. These groups had nothing to offer from the occasional visitor's perspective. When Europeans reached the New World, they did so in order to find a way to the other end of Eurasia. Europeans knew about a land in the west, but did not care, until the brutal conquest followed in the sixteenth century.[35]

The three landmasses were isolated from each other nearly as if they were on different planets for at least fifteen thousand years until about 1500. Then, initially both of the Americas, and somewhat later Australia, were connected to larger landmasses.

This "experiment" has been noted, and it shows a number of parallel processes, indicating that human history follows a regulated main direction (though with multiple pathways). The two largest entities, Afro-Eurasia compared with America, have proven that socio-political systems were akin to each other (though America remained in an earlier phase). The Maya kingdoms were small polities fighting each other (which we now know from the deciphering of the preserved texts), in a way that we can find many times on the Mega-continent. Other similarities were early metallurgy, and the first large buildings being pyramids, etc. Generally, America had a reached a historical phase similar to the Bronze Age in Afro-Eurasia.

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[35] Lindkvist & Myrdal 2018: 525 about how explorations must be seen in relation to interest.

Population density gives definite proof of the connection between scale and velocity of change. The three landmasses included one very big (Afro-Eurasia), one of medium size (North and South America) and one small (Australia). Density of population is a rough measure of technology used to exploit the available resources, and more precisely it shows the general level of land-productivity (with enormous differences between the two larger landmasses). When the three landmasses came into contact in the sixteenth century, the previous population density per square kilometre has been estimated to about 0.025 in Australia and 0,3–1,0 in both Americas, and 3–5 in Afro-Eurasia. The lower figure for America is certainly underestimated, but Africa's population is also often underestimated, so the higher number for Afro-Eurasia is probably the most plausible.[36]

If the entire world had a population density of the Australian landmass around 15 000 BCE, the annual increase would have been nearly twice as high in the Megacontinent as in America, and the Megacontinent has about twice the area. Yet, there is no rule of the thumb saying that twice the size gives twice the increase of population density: firstly, the numbers are just approximate; secondly, many factors other than scale influence the gradual increase of average land productivity. The only conclusion we can draw is that size matters – a larger population causes faster growth.

From this example, The Big Experiment, I turn to the complex reality in all its messiness, and start where my journey once began: in research on technological details.

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[36] Kremer 1993: 709–710 discusses this as a "natural experiment." His numbers are at the lower end for America and at the higher for Afro-Eurasia. His discussion has been mentioned by Wright 2000: 29, for instance. The numbers are from Myrdal 2004 where I have a more source-critical discussion of the population numbers. Livi Bacci 2008 5, 239 argues for a number around or slightly lower than the higher estimate.

Systems in material culture

Following the sources

A short account of my research can serve as a guide to some basic concepts and ideas in this theory kit. I started regionally and gradually upscaled this to a global survey, and the systemic approach was a core issue along the way.

Technological complexes. My discovery of technological systems evolved from a study of medieval Sweden, aiming at exploring the material basis, the "productive forces" in Marxian terminology.[37] I had worked at *Nordiska museet*, an ethnographical museum, and knew how multifaceted the material culture is, and set the goal of examining every researchable element of medieval agrarian technology, presuming that details of crucial importance would otherwise be overlooked.[38]

Two misconceptions had to be avoided. 1/ The ethnographical ever-past, an unchanging material culture, was an illusion. Technology has always changed. 2/ Economic historians working with the Middle Ages had only a faint knowledge about technology in all its details, and often only mention a few inventions: the plough, the mill and one or two others. They even talked of a "plough" as one single invention, when it in reality was made up by a number of components and existed in a number of variants (types).

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[37] Even from my late teens, I was interested in the history of tools, inspired by Marxism and archaeology, and have never understood why Marxists in Western countries have had such a lack of interest in detailed investigations of material culture and technology in all its details.

[38] The two main works regarding medieval agriculture are Myrdal 1985 and Myrdal 2012c, and to these come a long series of articles regarding specific subjects, such as the history of the spade or the scythe; specific source-materials such as wood archaeology or images; or investigating strange customs such as renting out cows.

The abundance of sources in Sweden regarding medieval agriculture is neither overwhelming nor insignificant. I decided to go through all that could give any hint about tools and methods. After spending a couple of years with this, it was possible to identify how and when a number of innovations were introduced and spread. A pattern was clear: innovations spread together. A cluster of interrelated changes became of importance around 1000–1300. I labelled this a new "technological complex."

I soon realized that this idea was something taken for granted, though it was often labelled "a technological package," but most scholars made the classical mistake of only considering a few key inventions, and even more problematic was that the "package" was seen as so obvious that it did not lead to any further theoretical conclusions. Consequently, this use of "the-few-inventions-package" (wheel plough and three field rotation, etc.). meant that a real understanding of how technology was adapted to the regional environmental, such as soils, climate etc. evaded most scholars.

One corollary is that we have to understand the single invention in a new way. A single item could exist as known but not utilized for a long time until it fitted into a new system. We also have to regard the incremental amendments of technology, with variants, prototypes, and the more prefect forms. I will return to this below, when discussing change of systems. Another outcome of technological complexes as they are analysed here, is that they must be seen and analysed as entities.

Technological complexes and social structures. Regional systems have to be understood as such, which as mentioned make them different from world systems. A regional system consists of many interrelated components cogged into each other, and the sheer quantity of elements forces us to understand this as a system in itself before we can relate it to other systems. I want to sharpen this further with this claim: How technology functions in and for a society cannot be fully analysed if the intrinsic interrelatedness in a technological system has not been studied.

The systemic approach does not exclude other types of analyses, and one can look at the relation between single technological elements and the social structure, because a social organization can be built around a specific technology or a limited set of technological elements. The social system and technology are then directly functional for each other, and as a result can to be studied as a unit.

One example is the village community, often built around core tasks or resources that have to be conducted and organized by the whole group. I explored the connection between the village community and a new type of wooden fence that spread in the High Middle Ages.[39] The fence-type was confined to heavily wooded areas (in northern Europe), as it basically was a wooden wall, with dangerous pointed stakes. Thousands of kilometres of these lead to a strict partition of the landscape, including a division between fields, meadows and pastures. A prerequisite for this enormous effort was cooperation between farmers, where all were responsible for their sections, so everyone was dependent on all of the others. This then formed a new basis for the village communities.

Around the world we find similar solutions, for instance around organizing irrigation or exploiting common pool resources in the outskirts of villages (which relates to the common pool theories).[40] However, if we want to understand the society as a totality, these examples of direct connection are not sufficient (which also is valid for a company in a capitalist system). These direct linkages only explain parts of the interconnectivity between technology and social systems.

It is not only the total complex, but also the tendency of a technological system that has to be studied. In the High Middle Ages, the common tendencies were an enormous leap in land productivity combined with more use of iron (iron was consumed, by wear and tear). These tendencies were interrelated with other trends, such as a growing population, new property rights, an expanding secondary sector (crafts and mining) and an expanding exchange. A more complex social web correlated with the transformation of agrarian technology (and other branches of material production).[41]

Technology historians have launched the expression "a seamless web" between the social and technological factors.[42] These ideas were a reaction to narrowminded

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[39] Myrdal 1977. This was further elaborated by one of my PhD students, Kardell 2004.

[40] See Ostrom 1990, and the enormous ensuing discussion.

[41] As a PhD-student Georges Duby was my hero, and my dissertation from 1985 was an attempt to write a Scandinavian counterpart to Duby 1968 (1962). Myrdal 2015 is a survey of the ensuing discussion. His critics were correct in some details, but the idea of a major technological leap forward around 1000 still holds. We have to switch the interest to the technological complexes and the stepwise change from prototypes to perfect types. So, the wheel plough existed before, but now became better and more widespread.

[42] An important text is Hughes 1987; see also Joerges & Braun 1994.

research: engineering history often focused on the single inventors. To some extent, regarding a factory, the idea of a web is relevant, but in my opinion, new technology history went too far. Such integrated socio-technological systems exist, as the previously mentioned village communities around common pool resources. But a social structure includes so much more, and theories about a "seamless web" tend to exclude so much that they hamper the understanding of the social structure as a totality and how it interacts with the prevailing technology in a society. The theory is related to the industrial company and even for the modern period it tends to underestimate the larger societal processes, such as class struggle.

Another draw-back with the new history of technology is its scholars tended to despise research on "nuts and bolts" (again rejecting an old-fashioned approach), which became a hindrance to seeing the inner systemic logic of technology. They could not see the technological complex separated from their imagined seamless web, and thus were unable to analyse how new systems evolve.[43]

World systems are different, as they have so few elements that a system cannot be fully understood without including additional systems, especially those in other spheres, but I do not think that a seamless web is particularly good metaphor for such interrelatedness, and will thus avoid it.[44]

The next phase in my journey following agricultural systems went from Sweden to Europe.

Medieval Europe. I went on to identify technological complexes in European agriculture.[45] They were all multifaceted and varied between different parts of Europe. It was puzzling that these different complexes gained ground in various parts of Europe at about the same time, c. 1000–1300, a fact that could not be explained by one or two key inventions that changed everything. Firstly, even the most important novelties were only elements of a larger technological complex, and secondly, even the key innovations were of totally different types in diverse environmental conditions.

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[43] For instance, they often were, as much as the old-fashioned history of technology, obsessed with the single inventor. A systemic approach would have showed how change is a societal process of inventing. Maybe some of them would protest, and I agree that they are not all strict adherents of this theory – and it has led to some insights into how a modern and large company functions.

[44] I am too much of a technology nerd to appreciate the simile: a "seamless" web: there is no such thing a seamless web in the history of textiles, in fact the seam is an extremely important element, also when large cloths are handled, such as in making sails to large ships.

[45] Myrdal 1997b, Myrdal 2012a, see also other articles in these volumes.

The plough (ard). Let us look at an emblematic and illuminating example: the plough. A common misunderstanding made by economic historians is to highlight the wheel plough, which only spread in parts of Europe (on the great plains from Poland to southern England and northern France). An important type was the socha, the two-pronged plough which spread in the East. The swing-plough without wheels dominated in North-West (in northern Britain and Southern Norway). The ard (without a mouldboard) was still in use in much of Sweden and Finland, but a new and stronger construction spread. All these variants were adapted to diverse social and ecological settings: the small plough in regions where small farmers dominated, the ard in regions where summer drought reigned as the ard preserves moisture better than a plough. (Southern Europe is another case where the ard continued to be in use.)

Furthermore, the emphasis on the wheel-plough has rarely been based on any understanding of the pros and cons of this implement. It is a strong but very vulnerable construction, which often had to be mended.[46]

However, all these types spread in different parts of northern and western Europe in c. 1000–1300 followed a common trajectory with two main components: they all worked the soil better and they all needed more iron. In all the mentioned types of ploughs the iron share became larger, and as the share worked the soil this caused an tremendous increase of iron consumption. (The wear for cutting implements, such as a sickle, is much less than for a implement that constantly works the soil, as a spade or a ploughshare.) Land productivity grew because more land could be cultivated with better ploughs, and at the same time the existing field were ploughed more thoroughly. Other innovations were also related to the increased consumption of iron, such as the iron shod spade, new and more varied types of axes, etc. This tendency – better cultivation and more iron consumption – was common during much of the leap forward. To this comes the whole technological complex these plough-types were joined into, with harrows, better axes and so on.

To summarize: We have several new technological complexes, with partly different elements, breaking through at about the same time. Why?

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[46] Together with Alexandra Sapoznik I am working on a project on the wheel plough, based on the extremely detailed English manorial accounts from the fourteenth and fifteenth century, see Myrdal & Sapoznik 2017 for a first report.

A plausible explanation for these simultaneous alterations of elements in several technological complexes could be a relation to social restructuring in all of Europe around 1000–1300, the emergence of socio-economic feudalism (which in the next chapter will be regarded as a European socio-political world system). Thus, we should look for overarching world systems transformed in an interrelated process, and where these world systems also changed in a feed-back loop with all their regional systems.

This was a transformation in many regions and in two main spheres (I will also involve the mentality sphere later), with common general tendencies affecting the whole of Europe. Beginning to conceptualize this convoluted grid of influences is the only way to fully understand a major transformation of Europe, the leap forward during the High Middle Ages.

Moving on from the Middle Ages, I continued forward in time, and wanted to research technology in the Early Modern Period. Later periods were already well known to me, as my research is like a cross, at length from prehistory to modern times (even the future) of agrarian history, and the bar is the Middle Ages and sixteenth century where the whole folk-culture has been my field of study. I was well acquainted with the agricultural transformation, the agricultural revolution, during the eighteen and nineteenth centuries, and had worked with the leap forward to the twentieth century.[47] The long agrarian history was my home ground, but I wanted to dig deeper into the sixteenth century.

Sixteenth century Europe. I wanted to know more about long term change, and decided to explore the rural development in the sixteenth century, now with a wider scope, regarding the economy as a whole.[48] In this project a totally different source situation had to be handled. The Swedish state apparatus went from weak to strong, and one million pages of accounts have been preserved from the hundred

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[47] One of my research projects concerned peasant diaries to understand what happened on the ground and in detail during the agricultural revolution (including a project where we collected hundreds of such documents), I also did research on the transition from sickle to scythe, on the new ploughs and many of my PhD students wrote about this period. I lead a large project collecting memories about technological change after WW II, involving seven thousand farmers working in study groups. It was a joint project between the Nordic Museum (*Nordiska museet*) and LRF (The Federation of Swedish Farmers). The memories were also sent to regional museums. My co-worker was Anders Perlinge who also published a volume on the project.

[48] Myrdal 1999a, Söderberg & Myrdal 2002.

years following after the early sixteenth century (and then the number of preserved documents produced by the state continued to escalate). The sixteenth century accounts from state owned farms are of such a high quality and level of detail that they have few counterparts in Europe.

A new technological complex in agriculture did emerge, but not as profound as the one in the High Middle Ages or as in next great break through, the agrarian revolution in the eighteenth and nineteenth centuries. The advance in the Early Modern Period was to a large extent an enhancement of the foregoing medieval transformation. When comparing Sweden with the rest of Europe, the similarities were striking: this change was an intermediate stage between two great strides forward.

My research also included the Late Middle Ages, otherwise it would not have been possible to date innovations neither before or after. From the late fourteenth century and in the fifteenth century the major technological tendency was directed towards labour saving. The population decrease meant that land had to be managed with fewer hands. Fields became pastures and meadowlands, methods to cultivate and tend the animals became more extensive. For instance, scythes and rakes were made more efficient (i.e. longer blades on the scythes and longer heads on the rakes).

The overall effect was that more resources could be directed to other activities, such as textile production. In the following leap in agrarian technology these innovations were kept, so this sixteenth century intensification started from a higher level acquired during a Late Medieval strive to make production more efficient – a pattern typical for all technological change (and I will come back to that in the section on reconstruction after a crisis).

When working with the sixteenth century, one of the most interesting findings is that agricultural production became more directed to supporting the secondary sector, which could be explained by the foregoing expansion of this sector, due to agrarian efficiency with higher labour productivity. The secondary sector acquired a position as a focal part of the economy. In Sweden the mining industry was a hub of the economy, and the surplus from agriculture went to sustain the iron and copper production: grain from central Sweden as well as oxen from the southern woodlands. With increased export of iron Sweden became to a greater extent included in a market with heavy and voluminous products in Europe in the Early Modern Period.

Comparisons showed that this was a common tendency all over Europe in the Late Medieval and first part of the Early Modern period: a growing production of crops and animals intended for long distance trade to support the most advanced core regions with a developed industrial production, typically the Low Countries (Belgium and southern Netherlands). From Hungary to Denmark came oxen and from the southern Baltic grain to the core. Transport capacity took a leap and less expensive products could sent over long distances. The trade with staples did not only include basic food products, but also wool for the textile production, cloth etc. A geographical division of labour emerged where comparative advantages could be more fully utilized. This development of shipping was related to the European more direct entrance into the world trade (see Appendix A).

From Europe I wanted to look further afield, to see if these patterns existed globally. My quest to understand the technological complexes, and how they changed pushed me into world history.

With this we reach the heart of the first part of this text, being quite detailed (though based on much more extensive reports). My study started here, as I wanted to explain the categorization for wide-ranging systems. The whole world was under examination, how agricultural systems evolved, spread, shrunk, etc. Such attempts existed, but not embedded into a coherent theory. That is the explanation to why the focus now will be at categorization.

Global categories – sailing close to the wind

I soon realized that global agricultural systems had been a researched for a hundred years, reaching a peak with the publication of Grigg's textbook: *The agricultural systems of the world* published 1974. The historiography of this research is a story to be told in another context, here it is enough to say that at first geographers considered agricultural differences to be an effect of environmental factors, such as climate and soils. Research from the early twentieth century showed that the whole culture had to be taken into account. For Grigg this meant describing a long history. He based his categorization on a seminal article by Whittlesey from 1936, where decades of intensive research by a number of geographers was summarized.

Whittlesey had 11 categories: nomadic herding; livestock; primitive subsistence agriculture; intensive subsistence agriculture with wet rice dominant; intensive subsistence agriculture where wet rice was not dominant; plantations and small farms; Mediterranean agriculture; crop and livestock farming; grain farming; dairy farming, gardening and fruit (the latter three described as commercial). He also had little or no agriculture as distinctive category. Grigg transformed these into: shifting agriculture: wet rice cultivation in Asia; pastoral nomadism; Mediterranean agriculture; mixed farming in Western Europe and North America; dairying; the plantation system; ranching and large-scale grain production.

These categories are seemingly problematic, both Whittlesey's and Grigg's, as they are not exclusive, instead they are partly overlapping. Furthermore, their categories are not organized into a coherent system where one feature is the dominant, and others are used to shape sub-categories. Grigg is aware of this and explains that he to a varying degree have used five general criteria to form his more specific categories: crop and livestock association; methods to produce; intensity of land and labour; disposal of products for consumption and structures used to house and facilitate production.[49] This explanation did not solve much of the problems, and in fact caused even more overlapping.

It would seem a bundle of categories like these would to be a failure, soon to be abandoned. The opposite happened. They are used and have been refereed in decades. The explanation is that these categories were related to empirical data: this is what was found when many studies were compiled to a global whole. With a metaphor I would say that Grigg and Whittlesey were "sailing close to the wind", when they formed these categories. They catch the reality in all its complexity and variation. This is what was found on the ground. Pragmatic and *empirical based categories* had to be used, even when this meant to catch the wind of evidence from the side.

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[49] Grigg 1974 3.

Global agricultural systems – a suggestion for Eurasia

To understand the extent and spread of systems we have to accept overlapping. Wet rice existed and was locally important in many systems, for instance in the Mediterranean, but only in eastern and southern Asia this formed the base for the system. Intensive agriculture combined with extensive can be found in several systems, for instance in the mixed farming system of Europe (the Netherlands compared with northern Sweden, both being parts of a mixed farming system). In northern China this intensity was steering all other elements in the system. Border regions often show a mix of systems.

These world systems have not always been there, and if they once emerged in a nascent form, they will probably at some point vanish or being transformed into something else. In this text it will be claimed that they, for different reasons, grew into systems more than two thousand years ago, and path dependence made them increasingly consistent, but they are now merging into each other.

A speculation about the future may be allowed, following from the long trajectory. The whole world is today becoming integrated not only into one market with bulk products. From one point of view this leads to a more equal and multifarious food culture caused by an instant flow of culture and information. A gradually merging into one world system will still leave a number of differences, caused by natural and cultural factors. From this a new set of world systems, in a new longue durée with other basic conditions, can develop.

Most of the categories used by Whittlesey and Grigg denote a pre-capitalist society, but four or five of them concern a commercial agriculture in the modern meaning of the word. Nearly all products are sent to the market, and the farmer is integrated in a capitalist system. As my focal point is pre-capitalist and pre-industrial periods, these categories are excluded here. (The contemporary period is certainly worth its own analysis, but not here. In our time the spatial division of labour is taken to its extreme, and in the future a possible backlash and return to the local is a definite possibility.)

The list. Around ten is an appropriate number of categories. This is what can be shown on a world map, without making the map incomprehensible. With more categories the overall view is blurred, and the general patterns does not stand out clearly. Some would think that this is an irrelevant determinant for the number of

sorts, but they are wrong. A map is an analytical tool, and corresponds to other types of analysis. Around ten is a manageable number for a proper analysis, much less than ten could be suboptimal as the study risks to be simplified – though in some cases where a very clear picture is requested just a few types could be sufficient, for instance Braudel's three time-levels.

The real world of course has an immense number of varieties. I have a pragmatic point of view. There is no absolute number, as well as there is no definite classification. In my study of agricultural world systems, the goal was to understand how they evolved in the longue durée.

I make a number of assertions, some of them against conventional views. In such cases my description is a bit longer, though all of them are short. Few references are given, as the text is based on hundreds of secondary works. (As mentioned the plan is to present a series of reports regarding different parts of Eurasia.)

With around ten categories I have to addend four to five to the lists suggested by Grigg and Whittlesey. Table 1 below highlight a number of overlaps. These are not just accepted, these intersections are an essential part of the whole systematization.

Table 1. Some features existing in several world systems

Some features existing in several world systems	Number
Agriculture lacking, or mainly lacking	1, 10
Intensity, where large parts of the landscape is cultivated	2, 4, 5, 6, 8
One crop is dominating	4
Climate is decisive	3 (7)
Agriculture and arable farming mixed	3, 5, 8, 9
Water management important	3, 4, 5, 6. 8
Stabling of animals: in principle all systems besides	7
Ploughing	In all, but not in 2 and 7 (interestingly ploughing was non-existing in most of Africa)
Processing of milk-products	Everywhere besides in 4

The main agricultural systems prevailing in Eurasia during the longue durée from the centuries before the beginning of our era until the nineteenth century are:

1. *Hunting and gathering*, with some influence on the landscape, such as burning to support grass to feed the prey. Prototypes to field farming and animal husbandry developed early.

Indeed, hunting and gathering have a history, also after the many millennia they dominated. Being pressed aside those that existed until modern times had learnt how to utilize very harsh environments. In such regions their strategies could be quite successful, for instance the Inuit, the "Thule-people", in the arctic developed a whole new technological complex in the High Middle Ages, and could utilize this region better than any other people had done before (including the Scandinavians in southern Greenland). The Inuit culture could thus survive also severe crisis periods, and form a vital hunting community in these harsh regions.[50]

2. *Extensive agriculture*, generally using fire to clear the fields. Three terms are in use, with no real difference in meaning: shifting, slash-and-burn or swidden cultivation. I prefer the latter, swidden, as more of a term than a description. Plot were cleared, the logs burnt, and after a while the fields were moved to a new place. Often this entailed long term planning, so the farmers could come back to the same plot many years later when the forest had grown back. This is an extensive agriculture, but only with respect to the whole landscape. On a specific field the cultivation could be intensive, even gardenlike.

Swidden belong to the earliest systems, together with no 6, cultivation of oasis and valleys. But we should not think of this as something changeless through millennia. One factor was that swidden was pushed back, and thus had to retreat to peripheral regions, or become a supplementary activity. Another factor was technical change. As all other activity, this was a part of generally advancing technology, with for instance iron axes. We also have specific innovations, such as the huutha-swidden developed in or around Finland, to slash-and-burn on the taiga, which was much more demanding than in deciduous or mixed forests. This technology arose around 1000 CE, and spread during the following centuries.

Also note that swidden, or any system with an extensive agriculture covering a vast area, must be protected by a society, otherwise they have to cluster into smaller areas that can be protected. The same is true for pastoralists: if they not have a negotiated situation regarding the use of pastures (not necessarily a state), wide tracts will be unsecure and dangerous.

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[50] The new complex included: a new style of kayak, intricate toggled harpoons, dog-sleds, better igloos, and so on. They could hunt prey at distance more easily, and even whales.

A further and quite important factor was that the forest, nearly all over the word, gave other desired products. This enabled swidden farmers to encroach upon the deep interior of the forests, where they had cleared fields as one part of a multifaceted survival strategy. This meant that an increasing trade in forest-related products also enhanced swidden. Not the least the sixteenth century is important, in for instance Southeast Asia.

3. *Mediterranean agriculture* is strongly marked by a specific climate, where the winters are mild and wet, and summers are hot and dry. Many elements are climate-related, such as the importance of perennial plants (wine, olives), and winter wheat. Transhumance of sheep and goats used the mountain pastures in the winter, and the herds were driven to the plains close to the coast in the summer, a pattern also steered by mountainous landforms and a fragmented coastline. Irrigated land and gardens were surrounded by large tracts of shrub and pasture for sheep. Another characteristic is regional specialization, which can be explained by the combination of fragmented landscape and a market economy utilizing the Mediterranean as a trading route. A closer mapping of the Mediterranean system often shows a mosaic of different small zones of specialized production.

This system had a long gestation period, starting with the first urbanizations in the eastern parts of the Mediterranean, 3000–4000 BCE. In the centuries before the beginning of the common era the system was fully developed.[51] A remarkable fact is that the Roman empire is one of the few large political entities that have nearly completely matched a world agricultural system, and this partly relates to how this system is related to trade and geographical division of production. The system of course survived the Roman empire.

4. *Wet-rice cultivation* dominates, and cultivation is intensive with investments in water-management. Animal husbandry is normally of less importance, and restricted to draught animals, pigs and poultry. Wet-rice cultivation is specific because land productivity can be raised to very high levels.

This system is one of the best researched.[52] One problem is that this research is infested by a strange competition: which country was the first to cultivate rice? This question is from a cultural history perspective rather uninteresting, and certainly

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[51] One of the best descriptions of how this system emerged and then prevailed is Sigaut 2004.
[52] Bray 1994.

does not aid in understanding how the world systems came about.[53] Different strands developed in for instance India, China and also later in Japan. Wet rice cultivation was of importance before the common era, over large tracts of southern Asia, such as in Szechuan in China, or in Southeast Asia. The real breakthrough for this as a world system came around 800–1000 CE in China, when the economic and political centre of gravity in the country shifted south. From then on, the Han-Chinese relied on rice, and intensive wet rice then expanded. The empire shaped a southern frontier for expanding intensive cultivation, replacing swidden. Also in Southeast Asia, the Thai people at this time developed more efficient technology for handling irrigation, and wet rice took an even more central position in the cores of intensive cultivation. (The whole process is of course much more complicated, and India also has to be taken into this complexity, where a specific type was the combined wet rice and swidden, which did not exist in China – but I will leave it there and come back to these question in a report on the agricultural history of eastern Asia.)

5. *Intensive cultivation* with other crops than wet-rice. Obviously intensive agriculture can be found all over the world, but in two main regions, Northern China and large parts of Northern India, intensification is the overriding feature with grains such as wheat and millet. These two differ in one respect: in India cattle is of immense importance, but in China large animals play a negligible role. This category may include some large river valleys, surrounded by nomadic pastoralism.

It could seem that this is just another residual category, like no 9. However, intensity as a goal is so demanding that is steers the whole agricultural system. There are good sources on Northern China and this region has been thoroughly investigated.[54] A number of technologies were developed to raise land productivity. Methods developed were mainly bio-technological, such as advanced cropping patterns combined with a number of varieties of all crops. Even something that in modern terms could be labelled precision farming was developed, with accurate amounts of water for every plant, etc. All these methods were in place in the Han-

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[53] I am not against research considering the earliest evidence of rice, or any other technology (first evidence of diverse water lifting technologies, which is another moot point). But when this becomes a rivalry between modern nations it is not only beside the point (general spread of an innovation is always more important and interesting than the first evidence), but also dangerous because it adds fuel to chauvinism and ideas of "we are better than you".

[54] Bray 1984 gives a full presentation. It should also be mentioned that this is one of the most detailed works covering agricultural technology ever published.

dynasty, the centuries around the beginning of the common era. At that time, a long-term tendency to decrease pastures and animal husbandry also started, though this would come into its full effect centuries later. Many of these methods fell into disuse later in the first millennium, but were taken up again from the Ming-dynasty (the Early Modern period). It could also be argued that the Han Chinese adaption of intensive agriculture was an asset when they took up wet rice farming on a large scale when moving south around 800–1000 CE.

Intensive farming in northern India has not been bestowed with such high-quality research (there have been many works, but few of them about agriculture in all its details), though it seems as though intensive farming started as early there as in China. Animal husbandry was integrated into this, because milk products (ghee) constituted a core element in the food culture (the religious and cultural significance of the cow is also of importance).

6. *Oases and some river valleys*, where there are intensive agriculture on small or rather small areas in large tracts of pastures, where the oasis interacts with nomadic herding. Oases can be seen as islands in a sea of extensive pasturing, and though these two systems are interrelated, I have chosen not to blend them into one category. Instead, two different categories are identified, dependent on which type dominates because this marks the entire landscape. In an oasis system, the small intensively cultivated area, the actual oasis, steers adjacent tracts politically and economically to form a landscape serving the intensive core.

Together with swidden, this forms the oldest form of agriculture, and without diving into the Neolithic, this type started at the valley slopes in West Asia (the Fertile Crescent), and then conquered the most fertile areas, causing an explosion in cultural history. This type has gone through alterations. One important change is the introduction of underground aqueducts to transport water over long distances without losing any from evaporation (qanats). This method originated in Persia, and then spread fast through all of Central Asia and West Asia during the second half of the first millennium of the common era.

I also want to mention a problematic region, namely central and southern India. Here major deltas were conquered and used for wet rice very early, around the beginning of the common era. (Most of the large deltas in Asia were not laid under cultivation until the world-wide agricultural revolution in the nineteenth century, but some came under farming earlier, such as the Red River delta in Northern Vietnam, and also the Yangtze delta.) An expansion came in southern India, in the

Deccan, in the centuries before and around 1000 CE, when dams were built to collect water from the monsoon. This transformed the whole area from a mainly extensive and pastoral use to field farming. In core areas, especially with strong polities, more intensive irrigation farming could develop. However, this cannot be considered as oasis farming, and I categorize it under the residual category no 9, though in reality it ought to form a world system of its own.

7. *Pastoralism*, with animal husbandry as dominant. Nearly all pastoralists have some kind of agriculture, though normally extensively and in only small plots. Even those pastoralists who conduct some kind of field-farming depend on sedentary farming communities, for crops and for many handicrafts, as most crafts necessitate a sedentary life. Pastoralists move long distances seasonally: they are nomadic, as pastures would otherwise be exhausted. They never move randomly, but according to fixed rules and planning.

It has long been known that pastoralism developed from farming, as a specialization, when a new type of landscape was utilized. The true pastoralist, nearly totally occupied with livestock and using the steppe, was a specialist in contact with agricultural communities. However, there was a trade-off between these two types. When they dominate the intensive spots (the oases) shrink in size and are subjugated to the needs of the ruling group. The core is now serving the margins, with profound consequences for the total landscape (compare no 6).

To understand how nomadic pastoralists could dominate larger populations in settled areas, one has to consider two specific capacities: 1/ nomads were mobile and often controlled transportation routes, 2/ they were normally experienced in mounted battles, as they lived much of their lives on horseback (and in some regions, on camels).

Leading scholars claim that pastoralism did not undergo technological modifications, which seems quite unlikely to me as all humans change their technology.[55] Handling of livestock is not as related to implements as arable farming, and thus to a large extent tacit and implicit, which is difficult to research. Certainly, production in animal husbandry has seen technological change with altered implements, not the

[55] Here, as in this whole section, a long discussion is needed, which I leave to further reports. The leading scholar is Khazanov, who is one of the best, but I suggest that technological change has to include tacit knowledge, based on my research on animal husbandry, which I have discussed for instance in Myrdal 2008b.

least in the processing of products.[56] But I want to highlight another aspect – the organization of nomadic husbandry.

In the nomadic regions much of the technology centred around planning when and where when to graze animals as conditions changed from year to year. If such methods could be made more efficient, the enormous pastures could be fully utilized, but that demanded an overarching organization that we do not immediately associate with a tribal society. But it is well known that their armies went through major organizational transformation. This started long before the Mongols in the thirteenth century, but they put changes through systematically. The whole army was organized according to a decimal system: ten-hundred-thousand soldiers. When looking at organizing pasturing later we can identify very intricate systems. Presumably such systems developed and the High Middle Ages could have been a crucial period. This is something that could be worth investigating further, and my assumption is that such a better utilization could explain some of the burst of activity from the nomadic societies around and after 1000 CE.

Nomadic pastoralists were dependent on sedentary communities to get products from field farming and also craft products. Among what they could sell in such exchanges, horses were often important, and here we also assume a change over time in utilizing the step.

A specific type is *encapsulated nomads*, moving in a cultivated landscape, a type which has existed from eastern Europe to central India. These pastoralists could also attain a dominant position so they steered a society. When encapsulated pastoralism became of a certain importance, and they controlled politics and the economy, these regions have to be regarded as pastoralist dominated.

Transhumance is something else, where herders take care of livestock and move them to distant pastures for the same reasons as nomads, to spare grasslands, but these herders are totally integrated in the sedentary social structure and do not form a separate group.

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[56] For instance, a more efficient way of making butter was developed in Central Asia and spread fast along the Silk Road in the second half of the first millennium CE. I have returned to this question several times, but a summary is presented in Myrdal 2020b. However, nomads could not have had heavy implements, and thus they continued to use the older method, a shake-churn. The new method thus must have been invented among sedentary farmers, but the importance of livestock may have instigated this innovation, and thus the pastoral dimension was a contributing factor.

The last phase of expansion for pastoralism came with large scale reindeer-husbandry, which spread in the Eurasian arctic from the seventeenth century until the nineteenth. In the larger picture, this was a part of the enormous leap in agrarian and global resource utilization in the period before the breakthrough for industrialism.

8. *Mixed farming* is a close integration of animal husbandry and arable farming. Over most of Eurasia animal husbandry and arable farming have been integrated, but this category has taken this integration further.

Here we encounter a problem of historiography, as this type of agriculture was held by some Europeans as superior. The result was that many other people declared that they also had a history of mixed farming. And they had a point, as livestock and fields were interrelated in many systems.[57]

Animal husbandry and field farming were separated in the oasis-pastoralist systems as well as in encapsulated nomadic pastoralism. In the rest of Afro-Eurasia, most villages had fields surrounded by pastures, and the animals were brought back on a daily basis. Manure was used on the fields and animals were used to work the fields or as beasts of burden. On a general level this is integrated field farming and animal husbandry, but mixed farming has as a more specific meaning.

A basic feature was that much of the landscape was devoted to fodder production, and this did not occur in the fields (as for instance in China, or in Europe after the 19th century), but in meadows (non-cultivated land where grass is harvested). Stabling of cattle was important in many tracts, but also in the mixed farming system outdooring existed. In England, with a mild winter, cattle could be kept outdoors throughout the winter, yet cowsheds were also used. It can be noted that stabling can be found over most of Eurasia (for different reasons, even in tropical Southeast Asia, but in that case as a protection against theft).[58]

Cattle was used intensively, and milk from cows was normally more important than milk from ewes and she-goats (in the Mediterranean cheese from goats and sheep

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[57] A rather strange backlash of the Eurocentric view is that on the one hand people from other parts of the world claim that they also had this developed type of agriculture, while on the other hand it has been argued that the "mixed farming" is not at all more advanced than other types – and here a digression about how to separate ideology and categorization has to be left to a future text on methodology.

[58] In Myrdal 1998 I have presented a survey of cattle sheds in Eurasia during the nineteenth and early twentieth century (based on anthropological and ethnological literature), and why they were built. Zimmerman 1999 has done a similar survey of Europe.

totally dominated). As in many other regions, manure from cattle was the dominant fertilizer, which was enhanced by the intensive use following from stabling. Milking is important in most of Eurasia, among the pastoralists and in India, etc. Intensive milking always forms a new and deeper bond between animals and humans – cattle and sheep do not give away their milk as machine, they have to be handled with "an eye for animals" (the equivalent to horsemanship).

Mixed farming is thus a specific integration of the two main branches of agriculture. It has generic pros and cons, and one of the more decisive aspects concerns population density, which has to be held at a rather low level, but the system also allows a certain flexibility because the shift to more or less extensive land use is easily facilitated enlarging or reducing animal husbandry.

Turning to the long history, this type of close integration existed early along the North Sea Coast, and especially after the introduction of iron spread in parts of northern Europe. The major breakthrough, when this type of closely integrated farming became dominant in much of the north and the west, did not happen until the centuries around 1000 CE. A set of general elements were established: manuring-fallow-pastures-meadows (for hay). A balance between field farming and animal husbandry was established, but could shift to being more extensive (more animals) or more intensive, though a tendency to increased intensity could threaten fertility (depleting nitrogen, etc.). To this came dairy production as an important part of surplus production.

This type existed mainly in northern and north-western Europe, but a similar type also developed in some parts of Himalaya, probably independently.

9. *Agriculture of medium intensity with different features*, which cannot be sorted under any of the mentioned world systems. Regions in this category are not backwaters, they just do not fit into anyone of the other systems. If I had worked with more categories they could definitely have been presented as systems in their own right, but now they are lumped together.

Southern India has already been mentioned. Parts of eastern Europe did not belong to the Mediterranean system, nor to the mixed farming region. In Russia mixed farming spread, but in the south nomadic pastoralists were expansive instead, until the great reclamation in the seventeenth century. Related to this, one could discuss if there is a band through Europe, from the east to northern Spain, that also has such specific traits that it should not be sorted under the two main systems in Europe.

This area had common traits, such as millet being of importance, which was then replaced by maize (corn) from the sixteenth century.

This residual category is important because it allows us to understand the other world systems, and to analyse them without doing violence to the truth.

10. *Empty or nearly empty regions*, with no human activity. We need this category to see how the first and the second categories were expansive.[59]

Summarizing. It is striking that several categories are region-specific, which is exactly what whole surveys want to study. This is not a necessity. According to the Rule, a few possibilities were feasible, and thus we have to ask: why did specific world systems developed in diverse parts of Eurasia?

Many systems existed before the period, the longue durée, under consideration here – and if we were to study earlier periods, other world systems must be considered (in hunting and gathering). Some of the major systems found their definite shape around the beginning of our era, such as the Mediterranean or the intensive system in northern China. Other systems did not reach a full expansion and their mature phase until around 1000 CE. Altogether, it seems that after a first transformative period in the beginning of the longue durée, a second major leap came around 1000, which can be regarded at the fulfilment of what had started a thousand years earlier, but in different forms over Eurasia.

I will come back to this when discussing the global rhythm, but we can already begin to conceptualize the lead theme of this entire text, where different world systems seem to change at the same pace – which only can be understood if we take all the spheres into account.

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[59] An interesting tangent is fur trade. Hunters penetrated deep into the wilderness, and were often also scouts for colonization. It could also be mentioned that this hunt for precious fur pelts caused the extinction of many mammals over large tracts – a relatively small number of humans can cause environmental destruction, which perhaps is superfluous to mention.

Change in the material sphere

The long-term tendency

When shifting perspective from system to change, we have to consider a very long trend, which at first seems to be undisputable – the tendency to increased production of material products. To understand this, I have a longer discussion in Appendix C. Here is the short version.

A simple answer is that without means to survive no other activities can occur. Production of food and shelter have framed the entirety of human existence. But humans are not bacteria in a test tube, and we cannot take for granted that the growth of population or increased consumption of physical products always will be (or even have been) the main objectives. A good life has included other pleasures, such as socializing, aesthetic experiences, and so on — activities that do not necessarily entail many physical products.

Indeed, Spiritual, emotional and aesthetic needs and wishes can often be satisfied without physical products (although human efforts are still needed, such as training to be a good performer, etc.). Biological needs are deeply embedded into culture and mores, and these can often be fulfilled without much in the way of material objects. Certainly, all these needs and wishes can be embedded in material consumption, and aesthetic and biological desires can take material form, in for instance buildings, weddings etc.

It must also be underlined that population growth is not an independent force in history. In fact, sexuality, family formations and child births have been strictly regulated by moral and social structures. Hunter-gather populations could keep their population at a constant and low level for hundreds of years and even longer. When population did increase it took place at very different rates, which cannot be merely explained by biological or external factors. Aside from the social and cultural, technological factors have also been decisive.

The decisively long trend towards increased materiality is discussed separately in Appendix C. For now, I simply acknowledge its existence, and intend to analyse how this major trend enfolds throughout human history.

We have to differentiate between three different trajectories, two of them related to the long trend and the third balancing the two others.

+ Population-increase (and density of population)

+ Improved land-productivity (and more intense use of all resources)

+ Augmented labour-productivity (a necessity to the development of social complexity)

Population density is related to land-productivity, but overexploitation is a definite risk. Land and labour productivity are related in something close to a zero-sum game, where more labour invested in a land unit leads to increasing yields, so that higher land productivity is balanced by lower labour productivity. This is not always the case, and when we look at a technological complex as a whole, it normally entails both types of productivity, though in a leap forward land productivity has dominated. We will come back to that.

The global population rhythm

One of the great mysteries in world history is *the global rhythm*: The wave of large-scale population-increase and stagnation was, to a large extent, simultaneous over Eurasia, and especially so when the far West and far East are compared.[60]

The basic rhythm in Eurasia during the last two thousand years in terms of expansion versus stagnation (or even decrease) is: from circa 700/500 BCE to circa 200/500 CE a leap forward was followed by a descending period until about 700/900; a new leap forward came from then until circa 1200/1350; thereafter a general decrease dominated the Mega-continent until 1400/1500, when a new period of expansion starts (West Asia at this time started to fall back, as an exception). This period went

[60] It is problematic that we not have a reliable demography dataset on a regional level based on modern demographic research, which is very vital. We still have to rely on a work from 1978 by McEvedy & Jones, if data are to be analysed on the regional and national level from a world perspective.

on until 1550/1650, and then stagnation haunted large part of Eurasia until circa 1700 (which in South Asia continued during much of the 18th century). In the 18th century a new increase gradually turned into an upsurge during the 19th century.

The pace of change surges with a growing population, which implies that the wave length become shorter. The period from one crest to another decreases. In a pre-industrial society these phases could last for hundreds of years; in our contemporary time they are measured in decades.

In passing it can be mentioned that this poses a puzzle for the future. The wavelength cannot be shorter, since it would lead to an unstable and unpredictable society. Interestingly it seems that population increase seems to have lost its role as a prime driver, and with wealth comes fewer children. Though we are indeed taking the most enormous leap upwards, this is by the same token a slowing down, and in a not too far future could lead to a stagnating total population (and in some countries even a falling population).

In 1978 Colin McEvedy and his collaborator Jones published a book, still quoted by scholars who want to make detailed comparisons of world population. The publication meant a big step forward for world history research at its time, though they tend to underestimate the population size outside the core areas in Eurasia, especially in America. In his concluding global overview, McEvedy noticed a very interesting pattern which has not been in the centre of attention for world historians, though it has been mentioned. He discussed cycles of growth and decrease, and noted that: "events at opposite ends of the Eurasian land mass have an astonishing synchronicity". The population curves rose, and then "overshot and fell back in approximate unison", a pattern which existed from antiquity, during the medieval period and continued during the 16th and 17th centuries. He hinted at different interpretations, such as parallel social development or a global climate, but also said that: "The whole subject is as important as it is ill-understood."[61]

As movements of population are fundamental for the scale of a society, many other long-term trends are related and the global rhythm can thus be seen as representing a number of phenomena.

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[61] McEvedy & Jones 1978 345–346. The Eurasian wave has been observed, but seldom problematized, see for instance Christian 2004 310, based on outdated population statistics from the 1970s. Christian has a simplistic disease-explanation.

From another angle, the similarity between the east and west has been discussed by Victor Lieberman.[62] He looked at equivalents in the political system with periods of consolidation followed by disintegration, and he identified an interaction of military, commercial and social influences which caused chain reactions over Eurasia as the main explanation of correlated changes. His periodization corresponds to the demographic rhythm (I will return to his results in the chapter on the social sphere).

These simultaneous wave patterns in all of Eurasia create one of the big conundrums and it will be an issue below, and in the concluding chapter I will try to give an explanation taking into account all of the three spheres.

Cycles

Before turning to causation of the main trends, let us return to the general comments on cycles made in the first parts of this text. There I pointed out the relation between a system shift and cycles, and now I want to go one step further and claim that cycles are innate to any long-term trend.

An expansion reaches the limit for the prevailing system; stagnation is then likely and a systemic change becomes compulsory for further change in the same direction. Quantitative change leads to qualitative (in the Marxist-Hegelian sense). The waves are also driven by feedback loops, where actions strengthen each other in a *virtuous circle* during an expansion, whereas the downturn is dominated by a *vicious circle*. An essential characteristic of the cyclical pattern is that the expansion carries the causes for stagnation and crisis, and vice versa. In the following, especially the crisis will be examined as a katharsis.

Intentionality is the fundamental cause for such processes and exists both on the individual and the societal level.[63] Comparing theories in psychology and social sciences on crisis can be helpful, as there are similarities, but the differences have to be kept in mind: people die but a society does not (at least not in the same way); conflicting goals in the mind of a person are different from social conflicts,

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[62] Lieberman 2003–2009, his point of departure is Southeast Asia.

[63] See Myrdal 2005a for a comparison between theories in psychology and in history/sociology. The section here is partly based on that article.

etc. An important similarity between the individual level and the societal is that dysfunctional reactions to major challenges are regularly unleashed.

Technical change

At this point I want to state that technology, so central in my reasoning, denotes problem solving in the material sphere. Undeniably, techniques to solve problems occur in all human activity – to organize meetings, to dance, and so on and so forth. But here technology in the material sphere is in the centre of my interest and analyses.

The dominant trend was an increased production of material products (see Appendix C), and not only producing food and necessities but also a row of other products (reaching its apex today). Increase of measurable quantities will reach a level where a qualitative reorganization is required, or to phrase it differently (with less focus on measurability), when incremental change leads to structural change.

Major structural leaps in the material sphere have been connected with the long tendency to an increased use of resources for millennia. Basic principles in technology can be used for many purposes, and some of them are applied both to increase intensity and efficiency, though usually one these two goals dominate.

Below I direct my main interest towards how systemic change comes about and technology leads to increased land productivity, focusing on resource exploitation to explain the overall expansion of the society when the whole scale is enlarged.

But before turning to technological complexes, as a necessary backcloth I will dwell on how single inventions occur. Most economic historians do not understand the importance of details, and ethnologists with an interest for details have been obsessed with typology without any keen interest in function and historical change.[64]

Technological change in its details. Material technology has a very specific characteristic:

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[64] In fact, ethnologists and anthropologists have often looked at details without any function, because those are useful to understand cultural influence. The argument is that if such details have spread, it is not merely because they are useful, but because of common cultural elements – and so they are proxies for cultural contact.

it is strictly limited by natural laws. In this respect, the Rule is stronger and human ingenuity is constrained by nature. This restraint is different and more inextricable from than those caused by social structure and mental paradigms. The French scholar Sigaut has labelled this practical intelligence, and he argues that in some respects this is more demanding than other kinds of ingenuity.[65] (Abstract reasoning can of course also be challenging, to take another branch of human mind.)

I have further developed this understanding of how practical intelligence works, by introducing three concepts: the "functional details"; the "prototype"; and the "perfect form".

+ The functional details are those under the focus of human creativity, those that must be invented to solve the most important problems faced by a specific tool (or method). It is not the whole implement that is considered (neither by the inventor or by the historian) but only the functional details. During a long history of a tool (or a method), different functional details can come to the fore to be solved.

+ The prototype is an attempt to solve the problems, but without really arriving at perfection. During technological history such prototypes are tested for all implements and methods; this is the way forward. It is not really "trial and error" because prototypes are used, but is rather more like: "trial and a quite good result".

+ The perfect form is when a functional type has been developed and spread – and note that the perfect form is adapted to the specific technological complex and to the environmental circumstances. Such a perfect form could prevail for centuries, and even survive from one technological complex to another.

Let us look at a spade.[66] Perhaps the reader (someone from the West) thinks that a spade is a spade. That is wrong.[67] The common spade today is a digging spade, aimed to work down into the soil, also into hard soil. Such a spade is not possible until iron is used along the edge; before that, spades were more like shovels used to work in loose soil. At first iron was not used much in the soil because of the wear.

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[65] Sigaut 2012.

[66] Myrdal & Sapoznik 2016.

[67] Types of spade is an interesting subject, and I am fascinated by the draught-spade, common all over the world but especially in easter Asia (a spade with two ropes and worked nearly like an ard). There are indications that this type was used in the slave-owning context during the Viking age in Scandinavia. Hoes comprise another interesting subject; they are extremely varied in Africa, which is related to the lack of ploughing instruments there.

It was not until around 1000 such spades spread in northern and western Europe, and then only with a sheath of iron around the blade – the iron shod spade. (Iron spades had been in use in the Roman empire, with enormous iron production). The functional details (besides the iron shod blade) were related to how one could apply power to the spade. Three functional details took form: the shoulder, the short shaft and the handle. Earlier spades had long shafts, with neither handles nor shoulders. The shoulder was of course for the foot, which gave power. The short shaft was necessary to be able to lean over the spade and press it downwards, and the handle also allowed arm strength to be used. The first "prototypes" only had one shoulder, but soon the "perfect type" appeared. This perfect type has survived the transformation from pre-industrial to industrial times, though the blade now is made wholly of steel.

For every single innovation we have to look at the details, because they are the inventions. Just one more example is the emblematic wheel-plough. Sometimes this is treated as one new invention, but that is far from the truth. It is a very complicated piece of machinery, consisting of a number of separate parts, all of them with a specific function, such as the wedge controlling the depth of ploughing, and so on.[68]

Inventions – innovations. One has to separate between inventions and innovations, where the latter is a general spread of the former. Important technology seldom spread as one innovation after another. Instead, whole packages of related innovations are introduced (as previously explained in the foregoing section on technological complexes). Note that the invention, as just explained, consists of interrelated "functional details", solving essential problems.

As inventiveness is continuous, new inventions were made or spread with the influence flow, but if they did not fit into the system they could endure as suppressed technology: in a small region, for specific tasks or just applied occasionally. Technology used by people in nearby regions was often known but not utilized because of this.

The general conclusion is that: *known technology is always more extensive than the technology normally in use.*

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[68] The English manorial accounts from the thirteenth and fourteenth century are so detailed that Alexandra Sapoznik and I have been able to estimate the number of times wheels were repaired on a plough, or how many withies used to link the wheel-carriage with the plough broke per week, and so on. The whole apparatus was under constant repair, which never is noted in the discussion about the wheel-plough.

The sequence of inventions follows certain regularities as some inventions have to predate others. The wheel was presumably used for the potter's turntable before put under wagons, and in America wheels were used on toys, indicating that in due time wagons would have also been invented there.

Diffusion. A longstanding discussion in anthropology between diffusionism versus proclaiming the importance of independent inventions can be solved by the Solomonic: accepting both as correct, but rejecting extreme positions as wrong.[69]

An interesting theory about the balance has been launched by Joseph Needham.[70] He argues that complex inventions are more likely to diffuse (they are harder to invent), while simpler ideas are more likely to originate independently. On the other hand, it can be noted that rising cultural attainment is a consequence as complex inventions occur more often and simultaneously in different parts of the world (modern science gives many examples). Also, simple inventions spread faster through more and faster contacts, and they do not have to be invented independently as often. Over time, these contradictory processes cause both complex inventions and simple inventions to be invented and spread faster.

Often it is taken for granted that core regions are more innovative than the periphery. Scholars describe how influences spread from the centre to the fringe – be it art or technology. As a counterargument, one could claim that human inventiveness is equally distributed, and in fact many innovations have come from the periphery. However, some factors speak for the core areas as hot spots for novelties.

+ One is the "cross-road effect". When influences are transmitted, they pass the centre more often than the outskirt, a factor which is of greater importance during periods where overland transport dominates. For instance, West Asia (the Middle East) was a bridge between Africa, Asia and Europe for millennia, and thus a region where many influences passed. It became a melting pot boiling with blended ideas.

+ Another factor is higher population density in core areas, combined with the social division of labour being more developed. When more people interact, and more specialists are at work, more innovations are made.

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[69] Anthropology is a subject which produces general and quite useful encyclopaedias. General encyclopaedias in anthropology that I have used are, for instance: Barfield 1997, Barnard & Spencer 1996, Ingold 1994. Then we also have databases, but they serve a different purpose than presenting dominating theoretical paradigms.

[70] Needham 1954 228–229.

+ A third factor is what could be labelled "the empire effect". Empires regularly attracted (or commanded) intelligentsia to their centres (from Persepolis to American Universities), and intellectual endeavours become enhanced in the core. The opposite tendency, which also exists, is a freer mode of thinking in the outer rim of an empire.

Periods of fast change, "revolutions". A new system is breaking through as an entity, after a long period of building up possibilities, as suppressed technology. Some of this available technology will become parts of the new technological complex.

The actual transformation when a new technological complex becomes dominant normally goes rather fast. A number of processes are at work besides the surfacing of earlier hidden technology. A new system will instigate new inventions, often to fill in necessary gaps. Technology is introduced from other regions, because it fits in. Smaller adjustments and more weighty inventions are parts of these processes. Some of the changes occur when prototypes turn into more perfect types.

Additionally, main sections of production interact: typically, more iron production will lead to more efficient agriculture which can sustain more workers in mining and iron processing. Transformation of one sector of production can even be a prerequisite to change. New technological complexes thus break through simultaneously in several core sectors of production.

After a long period of slow change, after the possibilities in the existing system have been exhausted, comes with the new system a phase of faster change. Material culture does not change instantly, partly as a consequence of the massive investments needed. A relatively faster paced alteration could take hundreds of years, though it today normally occurs over decades).

Such periods are often labelled "revolutions": "the medieval agricultural revolution" or "the industrial revolution". The word is borrowed from the social and political sphere where a switch can be hasty. I will stick to this terminology, and consider the transformation from one set of technological complexes to another as a true revolutionary change, affecting the entire society.[71]

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[71] "Revolution" is a good example of etymology as a red herring in defining a term – the original meaning of returning to the starting point has been totally reversed, and today revolution means the opposite: to leave the old behind and start something new. See Koselleck 1984 for the history of the concept.

Sometimes it is argued that revolutions of technology are not fast enough to merit this label, but this is to overlook the specificity of change in material culture and the fact that earlier periods generally experienced slower developments than today. To conceptualize how deep going these changes actually are, how "revolutionary", let us turn to the virtuous circle.

Virtuous circle. New inventions demand further inventions; increased production in one sector causes bottlenecks that further drive inventiveness. A virtuous circle is released during an expansion phase. Production swells faster than societal needs, which gives a large amount of available, "free" capacity. *Free capacity* is here defined as the difference between societal necessity and the production capacity of a society. (Note that reproduction is regarded as a societal need, see more below.) Available capacity can now be invested in new technology and expanding production, and more investments further increase capacity.

Such periods could appear, to the historian studying them, to be vibrant and dynamic with expansions on virtually every front. It seems as though the entire population have suddenly become exuberant and are pressing forward. The societal mentality of such periods plays a role, but we also have to understand this boiling creativity and forcefulness as a result of the strength of virtuous circles.

Threshold. Transition is not effortless, which also explains why less efficient systems can live on for a long time, despite more efficient alternatives being already at hand (as suppressed technology or available technology in nearby regions). During a transition, new investments are needed and the old have to be abandoned. The cost will be always be high, forming a part of the threshold.

Another part of the threshold is the necessary destruction of parts of the old system (the social structure is discussed in the next section). Investments in land and capital proper (buildings, implements, etc.) are abandoned. There is a loss of human capital, as all technology demands skill and training. In a transition some will be hesitant, or even hostile, regarding the loss of skills and knowledge, especially those who master such skills.

The threshold is a main reason every technological complex fulfils its possibilities before being discarded. The gains of a new system not only have to be large enough to pay for the costs, but must also be obvious to the population at large. Holding on to existing methods is to avoid risk. The production in a pre-industrial society had small marginals.

In this theory kit stagnation is an inextricable corollary of expansion in the material sphere, and a crisis is a likely consequence of stagnation. The searchlight now is directed on these.

Stagnation, crisis and reconstruction

Stagnation and crisis

Expansion and stagnation shape the global rhythm. In a phase of expansion, technological changes lead the way, and in stagnation-crisis phases the social system is dominant instead. Altered technology widens the possibility space during a phase of expansion, and the social system is adjusted to be functional for any new capabilities. During a phase of stagnation and crisis the social structure drives the process instead, at first decisively in a vicious circle, and then also leading the changes towards possible reconstruction, where a change of the social structure is a key factor. In the next chapter about social structures, I further elaborate on how a crisis enfolds.[72]

Diminishing returns. When the pace of technological change slows down, a given outcome is diminishing returns. Once the agrarian technology becomes fairly constant, the average output per area unit falls and further expansion of the cultivated area eventually leads to marginal land being cleared. Both average labour and land productivity decrease. Total production could still increase, but starts to lag behind a demographic rise and continuous expansion of other needs.

These tendencies are relevant for most resources, and as branches are interdependent, the entire society stagnates. Technological complexes reach the mature stage and gradually all of their potential is accomplished – because of the threshold which hinders a switch to a new system.

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[72] I have returned to this issue a number of times, and two articles which deal specifically with crisis are: Myrdal 1997a on environmental crisis and Myrdal 2005a where I discuss the concept of "free capacity".

Overexploitation. Inertia steers much of human activity; people continue in one direction, and every human utilization of resources has an innate tendency to overexploitation. As always in this text, I will try to avoid overly simplistic statements about one single factor.

As humans can imagine what is not, they want more than there is. This is not just about getting more goods, but also about continuing to use well-known methods of acquiring more of the same.

Humans are conscious beings who plan, and it would seem that they would quickly realize that the methods they are using lead to a degradation of resources, and will eventually threaten their production. They ought to act accordingly at once, but this is obviously (and unfortunately) not the case, as humans time and again overutilize their resources. The reason lies in our ability to imagine what is not, and thus ignore reality when things go wrong. (The drinker's dilemma – denial.)

In a pre-industrial society, the process evolves in this way: the population still grows fast because social restrictions about raising children became less rigid and such habits change slowly. During the expansive phase also other societal needs were more demanding (such as building cathedrals in the High Middle Ages). Gradually they are transformed into imperatives. To meet these available needs, when diminishing returns prevail, resources have to be exploited even harder.

The solutions are sought where they used to be found, often turning to more of the same instead of in a new direction, for instance, using more irrigation to solve decreasing production caused by salinization. In an ecologically fragile environment this could lead to a definite degradation of the landscape, such as erosion in regions where the fields are laid out on slopes and hills. The damage can be long-lasting, and in some cases, restoration is not possible. In a more robust landscape, such as western and northern Europe, intensification in a pre-industrial agricultural area depletes soil nutrients and long periods of decreased productive capacity follows.

Humans form a further resource that can be overutilized. During an ongoing period of intensification, a very common repercussion is that people have to work longer. There is a limit as to how much workers can be pressed, especially in a society where the working classes are ill-fed. Pushing workers to the limit, combined with low living standards, makes them vulnerable to both diseases and exhaustion.

Into crisis. Today the word "crisis" has been inflated to denote practically every kind of problem. In this text "crisis" will only refer to a systemic challenge where the

whole society is at peril. In most pre-industrial societies, where the margins were small, a crisis normally entailed a population decline, which could be immediate or gradual. In an industrial society, with high per capita production, a crisis will instead be marked by decreasing living standards (caused by unemployment, etc.).

This tipping over from stagnation to decrease has several integrated causes, all of them with their roots in the long wave. Natural catastrophes will hit human societies during all periods, but in an expansive period, a pandemic or extreme weather conditions cause somewhat of a notch in a rising curve. There will be an available capacity, and as the population is on an upturn curve, losses will be replenished fairly soon.

In a period of stagnation such a downturn releases a totally different chain of reactions. What is considered as absolute necessary has to be reduced, which inevitably causes societal strife, and dysfunctional strategies throw the society as a whole into a vicious circle and structural crisis.

It can be argued that some catastrophes are so enormous that they would cause crisis under any circumstances. Nonetheless, the historic reality is that even such enormous disasters like the Black Death tend to strike during phases of stagnation. Europe, and also China, were at the brink when this emblematic disaster struck.

I do not claim that we should overlook or ignore catastrophes, quite the opposite – they are vital for understanding how crises enfold. For a long time, Swedish historians did believe that Sweden escaped the Black Death (an alpha-scholar had decided that this was the case, which is a sad Swedish historiographical story which I will not delve into here). After a thorough examination of every possible source, I could prove that this idea was totally false. Sweden was hit as all other countries were. Discussion was over. Every interpretation of Late Medieval Sweden since has had to contend with this undisputed fact. Moreover, I argued that this shock released societal forces that plunged Europe into a deep and long crisis.[73]

Vicious circle. In a stagnating economy, unleashing a vicious circle is an impending risk, and the crisis is in fact nearly unavoidable. The main tendency during phases of fast technical change is rising population and increased resource utilization. Stagnation is a natural part of long-term technological change, and when the production curve

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[73] I wrote a book in Swedish on the Black Death, Myrdal 2003, and then articles in English were I also included the rest of Scandinavia: Myrdal 2006b, Myrdal 2009a, Myrdal 2012a. See Myrdal 2010 concerning Swedish historiography and the tendency to form a hierarchy in the academic community.

flattens out this will eventually lead to a discrepancy between societal needs and production, going over into a marked tendency to overexploitation. All productivity goes down.

The reverse of what happened during a virtuous circle (see above about expansion) now takes place. Societal needs continue to expand, even when production stagnates. *Free capacity* decreases, that is, the difference between societal necessity and production in a society. It then narrows further to nothing. If a catastrophe occurs, extra resources are at hand, be it attack from barbarians or a long period of bad harvests.

Extra accessible reserves to meet a crisis are not there, and in a pre-industrial society the population is vulnerable to diseases and famine. (Maybe one could argue that in a modern society people are under stress, as the margins shrink.[74]) Societal needs, such as conspicuous consumption by the upper classes, hinder a downsizing of consumption, which would have been necessary to meet the crisis. Instead, more brutal infighting haunts the society. A feedback loop starts between a stagnant technological complex and a coercive social system (more to come about this later). The vicious circle of a crisis has now become a fact.

Reconstruction and technology

Even during a crisis technology changes. Population and production go down, nevertheless humans will try to keep as much land (and other resources) as possible in use. This is not only caused by inertia, but also by ownership and the risk of investments being lost.[75]

To put more flesh on these abstract bones, inertia can be exemplified: if a piece of land is not used the ownership of this plot can be lost; when large investments have been made in clearing an area, this investment is lost if some kind of use does not keep fields viable. Consequently, during periods of severe crisis, fields and other cultivated areas are seldom totally abandoned and left as wilderness.

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[74] I regard a phenomenon as just-in-time management to be a sign of impending crisis in our time.

[75] Such a course of events also occurs in other spheres, for instance in upholding a scholarly paradigm where older professors reluctantly accept new ideas.

The main tendency is thus a more extensive use of land – with fewer people relative to managed land. In Europe, typically animal husbandry increased on behalf of field farming, as a part of flexible mixed farming. However, in north Chinese intensive agriculture there was also a tendency for more extensive farming practices to evolve during centuries of stagnation and crisis before ca 1000 CE, and the most intensive elements of the system were abandoned.

When crisis goes over in reconstruction, this tendency to efficiency directed at bettering labour productivity is strengthened. Extensification is combined with new implements and methods, especially while the society as a whole gradually regains viability. Production per worker increases, following from the tendency to heighten labour productivity. Available free resources expand which paves the way for the next leap. A parallel process is the purging of inefficient methods that often survived during the expansion phase. The next upsurge with a new technological complex will occur on a higher level of average labour productivity. Escalating efficiency is a long-term trend, as important as intensity but with a different tempo.

Increased labour productivity thus occurs both during the leaps forward, when increased intensity and an enlarged scale dominate, but labour productivity is also enhanced in periods of crisis, especially during reconstruction where there is no increased land productivity (because any incitement in that direction is lacking when population and production generally decrease). Here we have the fundamental explanation of the rhythm between the two main types of productivity mentioned at the start of this chapter. As labour productivity is fundamental for a more developed social complexity, this also has consequences for how to view social change during periods of crisis and reconstruction. And now it is time to turn to the second sphere regarding social systems.

Social systems

Functionally and dysfunctionality

The social sphere is distinguished by strong system defending mechanisms. In the material sphere a tendency to perpetuation could be strong, but not as extensively conscious and intentional as in a social system. In the social sphere when self-maintaining activities are released, they can be very powerful. Stability is the preferred state for most people, and rulers have further interest in keeping a system intact if they profit from an uneven distribution of wealth.

A further consequence of self-defending mechanisms is that the systemic change of a social structure is more dramatic than in the other spheres, as the resistance to change has to be actively broken down. The strong system-protective elements in the social sphere are why I prefer to label such systems a social "structure".

At the centre of my attention is the relation with the material sphere, and we can start with how this is functional for the social structure. No activity is possible without production of matter, so any costly expansion of a social structure has to be supported by enhancement of production, which demands changed technology. Thus, the material sphere is dysfunctional if it cannot sustain the normal level of social activity. A further aspect is that increased labour productivity allows increased social division of labour, as more resources can be redirected to other activities than basic material production.

Turning now to causation in the other direction, the strength of the social structure is grounded in the connectivity to other spheres, which can be labelled its "functionality". Functionality is here understood in a rather basic way, as something facilitating and even enabling something else, and bidirectionality is an inbuilt condition.

Social structures have to be functional for production, but there is no such thing as a perfect match. Modifications are constantly ongoing within the system, in negotiations and conflicts. The self-defending inter-connectivity in a grid of societal elements can only go against general functionality to a certain extent.

However, dysfunctionality lurks under the surface of functionality. This is not just a simple turnaround, as both opposites have a dynamic of their own. A dysfunctional society could be functional for a certain group, though it weakens the overall fabric of society. For instance, a region can be infested with mafia, debilitating the life of most people but enriching the marauders, at least until the whole economic base becomes undermined. How dysfunctional reactions evolve will be further considered in the section below on crisis.

In a prominent book on social crisis Joseph Tainter emphasized how a society processing a greater quantity of energy and information had to increase its complexity, where the main characteristic is the variety of specialized roles interacting and bringing about a functioning whole. But he also argued that increased complexity leads to diminishing returns, eventually to crisis, and even collapse of the whole society.[76] His arguments are generally in line with what will be argued below, though I accentuate the multidimensional character of the social structure.

The credo of this whole theory kit is that only accepting complexity can allow us to see how major trajectories evolve, and the Rule should not be forgotten: a few different solutions to specific problems are nearly always at hand. The contradictions in human history imply that every functional component can turn into dys-functional factor.

I have listed some of the main components in this convoluted crisscross of interrelated elements, focusing on those that are functional for material production: 1 cooperation; 2 specialization, 3 protection, 4 leadership, 5 the state.

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[76] Tainter 1988.

Essential components

Cooperation from village to regional levels. On the local level a direct relation between a specific technology and a social organization, around fences, small scale irrigation, etc., could emerge, but regarding larger geographical units, on a higher spatial level, we instead have to look at social organization as a whole.

Water management in the Rhine delta and in China were the two of the largest such organizations in pre-industrial time, and they show how dissimilar solutions to a common problem can develop. In the Rhine delta and along the North Sea coast, democratic village organizations gradually developed into overarching regional systems. In China the state took a responsibility, even if the actual organization was firmly based at the village level.[77] These differences can only be understood if we look at the larger picture: the socio-political systems.

Choices between less and more democratic forms of cooperation existed over Eurasia, often in a mixture. The theory about common pool resources, and how these are regulated by the evolving of negotiations into rules is an example of democratic cooperation. Parallel to this, as a part of a more complex social web, top-down organizations emerged. A general tendency was that regional forms of cooperation tended to replace kin based, because the former is more adaptable to long term investments in land. Regional and kin-based organization could both be more or less autocratic.

Specialization is directly related to social complexity, and entails social and geographical *division of labour.* Social division of labour, with an increasing number of specialists in a given region, is a main tendency throughout history (as already explained, it is caused by increased average labour productivity). People act in diverse roles, and the number of contacts, direct and indirect, multiplies.

Geographical division of labour follows from how regional advantages can be utilized by the development of trade. Bulk trade especially affects material production. Well organized and protected routes and networks are a prerequisite. Pre-industrial large

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[77] In Myrdal 2014 I rejected the immediate link between water-management and hierarchy in a comparison of China and the Low Countries. This idea of a causation was famously argued by Wittfogel 1981, but strangely he starts to collapse his theory by remarking that if another kind of social structure existed, large scale water management could be done differently, Wittfogel 1981 12, mentioning the Netherlands.

polities tended to encompass different ecological zones in their realm, so a state protected trade and market could thrive (see Appendix A).

Protection and possibilities for *planning* are necessities for all production, both on a short and long term basis. Crop production is especially susceptible to damage, but a series of other segments of production are as well. Long-term investments will only occur when the entrepreneur is guaranteed revenue. As a result, much of the jurisdiction in a society has protection as a hub (against violence, theft etc.). Administrative structures (including for instance military) are meant to protect a society (but at the same token can be dysfunctional for the society). In a well-functioning society this protection includes the majority (or all) of the population and not only the higher strata. However, during much of history, protection has been used to disguise suppression and inequality.

Leadership and hierarchy exist in all societies. All organized activities need some kind of direction, where some individuals or groups have more influence over the course of events. The more complex a society, the more elaborate the management has to be. No society has existed without some people deciding over others. Even the earliest hunting and gathering activities necessitated foresight and supervision. Intrinsic in the demand for leadership is the emergence of a hierarchy, and this is connected to an inequal distribution of resources. In a complex society this will inevitably lead to a power structure expressed as a class society.[78] Inequality causes conflicts, and the struggle between different strata is an absolute corollary of hierarchy. The strive for fairness is thus ever-present and balances the simultaneously ever-present tendency towards strengthened hierarchy.

Egalitarian societies have existed, but they are not confined to a specific period. Ideas about primeval "communism" are false. In early societies patriarchal (or matriarchal) oppression was common (and could be harsh). Exploiting or plundering other tribes was not uncommon, and could entail some kind of slavery. The degree of equity and equality in a society is always related to the balance of power between different social strata.

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[78] This is a point where I have gradually changed my mind, and accepted the necessity of leadership in a society. I discuss this at some length in Myrdal 2006a 145–150, with references to Marx. Leadership could be organized in many ways.

In more complex societies hierarchical relations are formalized into *ownership* over factors of production. With this, stability and long-term relations are codified. This also relates to more regulated transfers of resources to the ruling strata (*exploitation*).[79] Such formalized power relations are fundamental to the social structure. They are also valid in relation to empires. In relationships between subjugated nations and the conquerors, formalized structures are normally related to the state organization.

Power, the ability to give orders, is basically a top-down process, following from the need for leadership – but this is also always a two-way process. The ruled have influence, in diverse ways, though that varies a lot between different societies. The power structure, the system of might and influence over human actions, is thus significant for the whole social structure. The power structure is also among the most fiercely defended parts of the whole social structure, because it not only distributes might, but also wealth.

State and legitimacy have been overarching and interconnected forces in most complex societies. In this text the term "state" denotes the highest spatial order of organization in a society with a certain level of social complexity, established by a geographical unit. This superior organization is overarching and to some extent controls other organizations in the realm.

From the dawn of human history tribes met regularly at specific places and times to negotiate, barter goods, exchange information and expanded the gene pools by mating into other tribes. In a long process with several steps, such necessary over-local interaction led to a state formation. On the verge of forming states, we find tribal conglomerates with a weak overlord, hailed as king (like the Bretwalda in England). These cannot be considered states, though we should not demand too much of the earliest state apparatuses.

As in all comprehensive classifications there are problems when drawing lines. If the state is seen as the highest organizational structure in a geographical unit emerging as a result of a gradually strengthened and increasingly complex social structure, one should avoid considering the state to be formed several times (the exception being after a state collapse). A rudimentary state apparatus and some kind

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[79] In a Marxian analysis ownership and exploitation have a decisive role, whereas in the theory kit they are regarded as important parts of the social grid but ultimately not ruling over or steering all other elements.

of accepted control over the realm have to be accepted as the first form, and later reorganizations can be seen as refinements.

Empires are conglomerates of geographically separate entities, and the rise of the first empires is in fact a clear sign of the existence of states. Over time the preconditions for what should be regarded as an empire have changed, and the earliest empires, with their loose control of peripheral areas, would not qualify as real empires in later periods. We stand over difficult delimitations, and all alliances cannot be regarded as having formed empires.[80] As I will return to, the question of empires has occupied far too much attention from world historians.

The state delivers warranties for many features in the social structure: for a legal system, for diverse forms of cooperation, safety along trade routes, etc. That the state has a monopoly on violence, which is often claimed, was only true for well-organized states. Many societies, such as feudal Europe, contracted accepted military and formal violence out to the nobility (with disastrous effects for stability). Certainly, the state is stronger if it has a monopoly over justice and military power, but there is no absolute correspondence between statehood and a monopoly on violence.

An important aspect of building a strong state is spelled *legitimacy*, and the strength of a state is the combined result of force and legitimacy. Dictatorship is not the synonymous with a strong state. A brutal regime can often be weak, constantly under the risk of falling into pieces. A regime which allows a certain amount of protest and influence from below is more resilient.

Legitimacy is dependent on how the population look at the state. If they follow laws and rules by free will (more or less), rather than because of fear, this is a sign of legitimate rule. To build a legitimate state is a long process. If social and economic systems are functional, a state is regarded as legitimate, and this is strengthened if large groups of the population feel that the rulers treat them fairly. The state is controlled by the ruling group, but always in a balance of power between different social strata.

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[80] One problem of definition is if the US today, and the USSR until some decades ago, were core states in empires. Maybe future historians will depict them as real empires in historical atlases and discuss how they dissolved as falling empires. I would argue that they form intermediate structures to a new form of international cooperation – with enormous alliances as the norm.

A strong state can transfer legitimacy to organizations under its protection and patronage, so for instance a village organization under the auspices of a benevolent state is stronger than if left to itself. As in all human history, this is a two-way process, where the many organizations on lower levels transfer power to the overarching state if protected.

Distribution. Different ways of distributing products (outside the family or the closer community) developed along with, and as a necessary part of, the more complex social structure. The market, the state, strong organizations did evolve before and during the longue durée.

Different forms of redistribution do not have such a central place in the theory kit as in some other theoretical systems (diverse economist, Marxist, Polyani's scheme, etc). In the theory kit, I have instead underlined the control over major investments, in saved labour (labour, land, capital) as a determining factor for the social organization, following a rough sequence.

I claim that one cannot identify a similar sequence for different kinds of distribution, besides major forms emerging when larger economic and socio-political entities take form. Market and state are born together, but the market and the state became options, not destiny. For some parts of the economy the market is a functional distribution system, but less so for others. The family has diverse roles. In a pre-industrial society it is often the production unit, and in later societies, child care and mutual satisfaction between spouses have been more prominent.

The market has become increasingly efficient in addition to the state. We often hear that we live in a "market economy". One could also claim that the state is more efficient than ever before (roads, hospitals, schools, etc.). All these forms of distribution evolve, and will be even better at doing what they are doing in the future.

During different periods and in diverse socio-political world systems, these forms of distribution have had a more or less dominating role. In later phases of a socio-political system, higher forms of organization are often necessary to keep the system together, which promotes the state, though in all societies the parallel evolution of resource allocation implies that a mixture will always be the most efficient for the society as a whole.

That said, a fundamental reason for focusing on distribution systems in large scale theories is that in this link between production and consumption, the surplus production for the upper classes is extracted. To a large degree, the class struggle has

been about how distribution should be handled. Basically, the upper classes promote the kind of distribution they have firmer control over.

If the upper classes base their power heavily on control over the state (as in feudalism in real "socialism"), the market and merchants are looked down upon. This does not infer that the whole social fabric is organized around the state, as that would lead to societal collapse. In medieval Europe the feudal system was more benevolent to trade than systems that existed before, so a dominant land-owning ideology for the upper classes did not mean that towns and trade were suppressed.

In a society where the masses have some control over the state (as in a democracy) the market is seen as superior by many of those in power (who control industry). However, a "free" market is an illusion, as every system for distributing products is embedded in both a social structure and a cultural paradigm (see the chapter on the history of the mind).[81] In a complex society like the one we live in, any distribution of resources will be bound by politics, habits, laws, ideology etc.

In no way do I suggest that we should stop researching the market, the state, and so on. Forms of distribution are important, but not the most important parts of the social fabric.

So far, this description has been (largely) a harmonic picture of society where groups work together to achieve basically the same goals, but to understand societal processes we have to make things more complicated and look at conflicts and disunity.

Social upheavals and class struggle

Cohesion and disunity brew in the same cauldron, and no social structure exists without conflicts. I will leave conflicts on the individual level aside, with the acknowledgment that they are all related to societal matters. To separate between horizontal and vertical conflicts is important, because the latter can be structurally challenging.

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[81] Freedom, of any kind, is dependent on an orderly, law-bound society. Freedom in the wilderness is being in danger.

Struggle between groups at the same level in a hierarchy can normally be contained within the existing structure, as they concern how power and resources should be reshuffled rather than how the hierarchy, the power structure, should be reorganized. Such conflicts haunt the ruling class, with hard conflicts over resources and control of the state apparatus. Also, among the lower strata we can find harsh conflicts, between villages, religious groups, etc. Both at the top and lower down in the hierarchy, such conflicts could build up until they break out into brutal civil wars or persecutions.[82] During periods of stagnation and crisis such conflicts often escalate, but they do not aim at reorganizing the social fabric and its hierarchy.

Vertical conflicts can normally be contained within the existing social structure. A continuously ongoing low-intensity "class struggle" exists in every society and at all times: law suits, protests, strikes, a slowdown of work and so on. When these conflicts erupt into large popular rebellions, social upheavals, the power structure is threatened and the whole social fabric is challenged. In such periods social struggle grows on many levels, from local clashes and upwards in scale.

At this point it is appropriate to discuss Marxism.[83] Marxian historiography points at "class struggle" as a major force in history.[84] I was quite influenced by Marxism as a young scholar, when this theory kit started to take shape, but very early on I identified problematic issues. On the one hand, attention was drawn to revolts of the masses, and on the other hand there was much weight put on the role of leading groups. For instance, the bourgeoisie was seen as crucial in shaping capitalism. To me this was an underestimation of the independent role of the masses, and not the least the role of peasants. (Marx tended to downplay the role of the peasants.) As a logical deduction of these ideas, many Marxists believed that the working class also

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[82] Wars between nations must be treated as a separate category, and could be seen as horizontal conflicts, but on a higher spatial level with very specific propensities. (Wars between empires and small nations is another thing, and are often close to class struggle). The total destruction during times of war could lead to vertical conflicts in a society and even to revolutions in the social structure.

[83] Marx will turn up now and then, but I am neither Marxist nor non-Marxist. To me he was simply a great inspirer whose ideas can be endorsed or criticized.

[84] Marx did not discuss class struggle during earlier periods at length. He mentions it in his early works such as "The German Ideology", and has a very general note on social contradictions in the introduction to "Critique of the political economy". In his major work "Das Kapital" he mainly discusses the struggle of the working class in his own time. Indeed, Engels wrote a book on the German Peasant rebellion in the early sixteenth century, and many Marxists have worked with historical class struggles.

needed a leading and extra progressive group.[85] To me the role of the broader strata of the population had to be analysed in a much more dialectical way, where their role as agent was acknowledged, but also considered the complexity of different forces clashing and cooperating.

Another problematic factor was the concept of "class". In Marxism "class" is a core concept, defined as a social stratum related to production and to how resources are distributed. This terminology is useful in analysing specific social relations (economic relations), and it has also been widely accepted far beyond Marxism.[86]

The problem arises when we try to apply the concept to social conflicts in their totality. Economic issues did have a crucial role, but a number of other areas of conflict were also important: religious oppression, cultural conflicts (languages, nationalities) and so on.

Subjugated people fighting for their rights and position against empires and conquerors form a category of vertical conflicts of eminent importance throughout history. One complication is that these subdued populations and nations in themselves contain different classes and class struggles. In such regions, a part of the upper class was often associated with the ruling conquerors (as a part of the interna class struggle). To regard such conflicts as class struggles is to stretch the meaning of the term, but I consider it appropriate to use the term in this in wider meaning.

Vertical and horizontal conflicts often merge, and nearly all large popular movements exhibit some kind of coalitions. The ruler and his entourage could support popular rebels to strengthen the state apparatus, or discontented groups among the upper class could join forces with rebels. This is often misunderstood, so that these parts of the upper classes are portrayed as utilizing the lower classes for their purposes. This could be the case, but it could also be so that the lower classes could utilize a split among the ruling group to forward their demands. Only a concrete analysis of demands and objectives in the specific revolt can provide an answer as to which group dominates.

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[85] Communists' problem with democracy can be traced back to these ideas, sometimes even cast as an idea of "dictatorships", proletarian. A main argument concerns how to shape an efficient organization of class struggle and societal leadership.

[86] In the theory kit, "class" refers to the social structure, and other features as status and lifestyle are considered to be consequences. I am totally open to other definitions of class in other theoretical contexts, such as the Weberian, but they are not used here.

Another misunderstanding concerns failure and success. Popular revolts are often crushed, and the leaders meet a fatal end, but if many of the demands were implemented afterwards, it must be regarded as a step forward, tipping the balance of forces in favour of those who rebelled. If taxes are lowered, the legal rights of the common people are acknowledged, and so on, we have to reckon popular movements as successful (notwithstanding a military defeat). The reason the upper classes yield is easy to understand: their rule has been shattered, and continuous, hard repression could risk bringing their supremacy to an end. Yet many large popular risings were real defeats, followed by long periods of hard repression and worsening conditions for the general population.

It cannot be taken for granted that the advance of one group among the population also leads to a better position for all other groups. To take one example: in England the lower classes, and especially the middle class, advanced during the period of revolution under Cromwell in the seventeenth century, but at the same time the oppression of the Irish became much harder. This said, a generally increased equity in a society normally affects many groups.

To make things even worse: during large social upheavals, alliances will shift, and a large popular rebellion could also go through a metamorphosis, and turn into a fight over control of the state apparatus.

When facing a convoluted phenomenon like this, a solution could be to take the empirical path down into the jungle of facts.

Empirical work with popular rebellions. When I worked my way through all of the Swedish medieval documents, searching for evidence about agrarian technology, I also noticed all of the evidence of class struggle. I could identify some major patterns.

Before the Black Death, conflicts about property rights (over woodlands, fisheries) between peasants and the upper classes were relatively common, as well as conflicts over the tithe. These were the remnants of a struggle over the establishment of a feudal society, for which there is some evidence from earlier periods with a few written sources (from the eleventh to the early twelfth centuries).

These conflicts vanish after the Black Death when the entire society was thrown into a deep crisis. In the late fourteenth century we get several cases of strife between landlords and their tenants (over a number of issues related to tenancy). In this period, we can also identify a steep decline of rents, so the peasants were rather successful. Much of this class struggle also took the form of tenants' foot-

dragging, "voting with their feet"; they left and there were many farms to be let. In some regions the nobility tried to control the movements of the peasantry (especially in Eastern Europe), which was a part of the class struggle, and in most of western and northern Europe the nobility lost.

Conflicts over taxes had been ongoing but became much more intense from the second half of the fourteenth century. The nobility and the ruler tried to compensate for losses of incomes (declining population and diminishing rents), by harsher taxation and the reaction from the peasants was not late in coming. These revolts soon grew, and were also related to the fight for control of the realm (in a contemporary civil war). The first national rebellion in Sweden based on a larger strata of the population came in 1370–1371. After a period of national reconstruction and many smaller tax revolts, a new wave came in the 1430s when a large-scale national revolt overthrows the regime (and led to major tax reductions). A hundred years followed when peasant armies were on march, in different alliances. Large scale rebellions and smaller outbreaks were combined, and the lower strata of the population advanced on nearly every front (lower taxes, control over courts, etc.). In the sixteenth century a strong state could be established, with rather strong popular support, and in the later part of the sixteenth century this was formalized as the peasants formed the fourth estate in the parliament.[87] The Swedish peasants were comparatively victorious, but this whole process was a part of a European-wide transformation.

The next step was to place the Swedish case into a European context. The discussion about medieval peasant revolts had been nearly "kidnapped" by a focus on the revolts in France in 1358 and England in 1381, as being models and the most important. I wanted to examine all of Europe, and at that time started to develop the "Iceberg Method" (though it had not yet been named). My assumption was that large scale popular rebellions would be mentioned in national histories. Every nation produces such, and they have ranged from very nationalistic to more analytical. My survey covered the period from around 1000 to 1500. The idea was to get a manageable number so I could search for special literature about every case, and make a catalogue. (I did a follow up until

[87] Myrdal 1993 is a survey of all popular movements in Sweden until the mid-fourteenth century, and for later periods there is quite considerable research summarized in Myrdal 1999b.

the seventeenth century, but only presented the maps, not the catalogue.)[88]

Limiting my scope was a major problem, and nearly all of the cases were mixed with other conflicts. I collected about fifty cases and discussed twenty more as close to large popular rebellions. A main finding was that the peak for large scale rural conflicts in Europe came in the fifteenth century, though the upsurge began in the late fourteenth century. The much-discussed French and English cases belong to the early phase of this wave.

Another major finding was the variety. Economic issues were often at the core, but demands included so much more: in Hungary, religious and national issues (the Hussites 1419–1437); in Catalonia, against serfdom (1460s and 1470s), and so on. In the later Middle Ages, many of these movements were related to how the country was ruled. A specific phenomenon was the peasant republics along the North Sea coast and in Switzerland.

A sweep over the whole period gives an outline. The centuries around 1000 were marked by expanding feudalism, and resistance especially in the periphery: northern and eastern Germany, Scandinavia, Wales, etc. These are problematic because they are often near the border between civil wars and popular rebellions. A low tide for large scale rebellions came in the thirteenth century (though of course they occurred).

After that came the Black Death, as previously mentioned, the period of large-scale rebellions. This was a period of crisis and reconstruction after the demographic decline. Many of these rebellions went beyond sheer economic goals, and raised the question of how a country should be ruled. Together with parallel minor movements, these were a major driving force in the reorganization of society.

Most of these rebellions were contained within the nation, but the conflicts influenced each other. For instance, a victorious peasant republic in Jutland (Ditmarshen 1499–1500) inspired a rebellion in Sweden a few years later (1501–1502).

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[88] Myrdal 1995 presents the results, with a catalogue and maps over fifty-year-periods from 1250–1549, and in Myrdal 1999b 343 I presented three maps comprising one hundred years each, covering the period 1350–1649. The last twenty years have seen quite a lot of research in this field and some of my results have to be adjusted. The main tendencies will still be the same. Among many new works, a source collection, Cohn 2004, should be mentioned, as it clearly shows how smaller and larger movements expanded together.

Following the large-scale rural revolt further on, to the seventeenth century, an interesting phenomenon was that they became more intense in the European periphery (such as Russia), whereas the core regions, where a strong feudal state had been established, did not experience major uprisings. But a new big wave came in the late eighteenth century, when a series of large revolutions put an end to the feudal system.

The next step is to make global comparisons, and I focused on China and Europe c. 1000–1500, because the historiography makes such a comparison feasible. Though the results are not yet published I will refer to some of the main results. One is that exactly as in Europe, crisis and large-scale popular movements went together in China, and the rebellions were an important factor in the reconstruction of the social structure. One such period was the eighth century with the fall of the Tang dynasty (followed by a long period with smaller polities), and the late fourteenth century with the fall of the Yuan (Mongolian) and establishment of the Ming dynasty.

In China a model for the socio-political structure was the empire, which also moulded rebellions. Peasant movements with specific demands were not as prominent as in Europe. Instead, China had enormous popular movements tip over into civil wars that not seldom ended in the government being overthrown. From this follows a number of consequences that I cannot delve into here (such as "bandits" having a central role in Chinese movements). It has to be mentioned that Chinese historiography tends to omit rebellions and defence wars fought by indigenous people, especially in the south.

Concluding remarks. I have used the term "peasant rebellions", but popular movements is often a better term as these movements included larger strata of the population (peasant rebellions being an established term). In an organized hierarchy a social stratum can be regarded as a "class" if self-conscious about its position and goals. Then class-struggle could be a proper term if we stretch this concept as much as possible, and for instance include the uprisings of subjugated people. In that case, the twenty-century world history would have decolonization as a major class struggle.

To be even more inclusive could become problematic. Apparently, women's struggle for their rights is a significant part of contemporary vertical conflicts. Certainly, women have always fought for their position, and throughout history we find many examples (Christine de Pizan with her fierce argumentation for equality around 1400 being just one of them). But I regard the world-wide change in the balance of power today (and the brutal resistance in backward regions) as something new. Presumably this is related to a changed socio-economic system, where the family

is no longer the most important production unit, a change which has spread since industrialization but now has permeated all modern societies and activities. In that respect women could be regarded as a "class" becoming aware of its own role, but this movement is so entangled with culture and mores that denoting it a class struggle could be problematic. Yet my guess is that in the future the whole society will experience new battle lines in societal contradictions, but also that the old ones will still prevail.

I will use class struggle as an overarching term (in a much more inclusive way than orthodox Marxism), but I prefer to talk about popular movements and societal vertical strife. I look at these movements as one of the prime-mower in world history, and especially during periods of crisis and reconstruction. This statement implies that I, before moving on, have to face the idea of oppression as a productive and even partly positive force in history.

Oppression and exploitation

A common belief is that the upper classes drive history forward by brutal exploitation of the lower classes. The populace is seen as a sluggish mass, which has to be forced to invest and learn. Orthodox Marxists also hold this idea, often expressed as original capital accumulation, which is conceived as exploiting and plundering.[89] The whole idea is unpleasant, but that is no reason to dismiss it. History is full of horrible things and we have to look at them cool-headed.

In all societies, inequality and inequity change over time, heavily depending on the balance of forces in the struggle between social strata. It cannot be taken for granted that a social stratum in the working population attain a better position because of its importance. Women often have a crucial role in the upkeeping of a society, and this could result in a more prominent position, but not always. Social strata among the working population rarely receive better conditions without actively taking part in

[89] It would be interesting to consider if these ideas influenced the ruler's neglect of average living standard in many real socialist countries.

bettering them.[90] In a societal hierarchy resources are transferred from the working population to the upper classes, which can be labelled exploitation. Related to hard exploitation is injustice, oppression, etc. The question is whether a regime's exploitation and oppression of its population could favour economic progression.

One argument for pressure as a way forward is that the population at large has to be forced to produce what benefits the whole society later on. This may function in the short run, but if the oppression is extended over long periods, resistance is built up which counteracts progression. Another counter argument is that hard exploitation leads to conspicuous, and not productive, consumption among the upper classes, a waste of resources.

Historical evidence in most cases shows that long term oppression degrades the social web, and counteracts general welfare. The Antebellum US, where the South stayed on a lower, unindustrialized level, while the North advanced swiftly and efficiently, can serve as a case in point.

A variant of the useful-exploitation argument is the claim that hard exploitation of one region, the periphery, could favour another region, the core, and cause an economic upsurge or even speed up the course of history. However, in many cases empires do not promote the total economy, as the core has to spend resources to control their realm, and furthermore much of what is sent from the periphery is spent on non-productive consumption in the core.

Sweden is an example of a small empire. It was only when the country was rid of its empire, around 1700, that an economic transformation of agriculture could start. The demise of this north European conglomerate state came in a two-pronged process: uprisings against the intruders in Germany and Poland; and in Sweden, a struggle by the peasants – inside and outside of the parliament – against the warmongers among the upper echelons of the nobility, and the goal of the peasants was lower taxes and an end to conscription.[91]

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[90] Scheidel 2017 has compiled proxies for inequality over thousands of years in Europe, and the general picture seems to be valid, but when it comes to causality, he neither mentions class struggle nor economic roles. In an in-depth analysis, van Zanden 2009 showed that an increasing role of women opened the industrial revolution in Europe. In Myrdal & Öye forthcoming, we argue that women's role in the economic leap forward around 1000–1300 in Europe has been underestimated, and our main examples are from dairy and textiles – women had a core position in producing agricultural products for the market.
[91] Myrdal 2007.

A more precise version of these theories concerns European colonialism, especially the British empire (see Appendix A). During a period in the nineteenth century, England was the industrial centre of the world, the industrial factory from which products was sent over the world, and this core was sustained with raw material and agricultural products from abroad. During this time it had a vast empire, so the link seems obvious at first. But such industrial core regions existed in many regions and periods, for instance the Low countries in the Late Middle Ages. And the link between the English leap and its vast empire is perhaps not that straight forward.

The influx of riches from the colonies could have played a role as a kind of Deus ex Machina, but the leap into industrialism and capitalism (societal power based on capital) is a much more complicated process, which only can be understood as virtuous circles, with a series of feed-back loops. Novelties in agriculture raised surplus production, as well as in industry, and a societal change released resources from feudal bonds, etc. It can even be argued that the eighteenth-century mercantile expansion drew capital from industry as the enormous profits from colonial profits were invested in manorial luxury in England. An interesting fact is that countries in Europe without many colonies, such as Germany, advanced quickly in the nineteenth century.

Indeed, the population at large are often prepared to make sacrifices in order to gain in the long run. Common endeavours in periods of defensive wars form a typical example, but I suggest that we turn our gaze in another direction. Large investments that pay off much later are common among peasants, and decided by them, such as terracing, irrigation etc. Both in periods of expansion and in periods of reconstruction, such activities, with strong support from the population at large, are common. But we have to acknowledge that some of these deeds came about by initiative from above.

I would argue that hard oppression eventually causes economic stagnation, even in the core regions in the end. This statement leads us to understanding further how stagnation evolves into a deep crisis.

From functionality to crisis

During an expansion phase an entire society is upscaled (more people, more production, more geographical area included, etc.), and the institutional structure has to be adjusted accordingly. This entails: restructuring social strata, new legal systems, other forms for negotiations, etc. For instance, in the European leap forward c 1000–1300, the pan-continental social change had the same direction with many common elements. A restructured hierarchy involved other types of conflicts, which in its turn demanded new ways of handling contradictions. In the European High Middle Ages "the peace of God" (and other means, such as new laws), laid a blanket of restriction over an expanding and aggressive nobility, so that remoulded classes could coexist on a new level of social complexity.

An expansion will inevitably go over into stagnation and eventually crisis, and a strict social structure tends to deepen the crisis. In the chapter on the material sphere some of the causes for a stagnation going over into a crisis are mentioned, but the full effect of a structural crisis cannot be understood until we consider how the tendency to overexploitation is aggravated by a dysfunctional societal reaction.

Surplus capacity is defined as the difference between the total production and societal needs considered as a necessity. In the expanding phase this capacity boosts, as production swells faster than the societally defined necessary needs. Resources can then be used to meet a row of new goals: further enhancing production, allowing increased consumption on different social levels, investments in large scale societally moulded building projects, etc.

Eventually what is considered as absolute necessary, both by the population and by the rulers, reaches a high level, and in a stagnant phase this cannot be sustained any longer. A large number of people have to be sustained, want to be considered as essential to be satisfied, and on the top of this comes a massive conspicuous consumption by the ruling class, considered by them as an imperative which defines them as a ruling class (their status) and gives them a military capacity to defend their position. A shrinking capacity will inevitably lead to social conflicts.

Catastrophes, diseases, years of crop failure, etc., will hit all societies. While the margins are narrowing, a chain-reaction is released; a vicious circle throws the whole society into a crisis. In the first phase of a crisis the social structure normally reacts dysfunctionally in several ways.

The tendency to overexploitation of a natural resource has a social aspect. If these resources form a base for the ruler's authority, depletion is met by even harder utilization. Related to this is the inertia following from the linkage between technological complexes and the prevailing social structure, which will hinder attempts to adjust the production to a new situation.

If the social structure is held together by religious beliefs or other ideologies, that also form a base for position of the ruling class, resources could be increasingly spent on such purposes (such as large building projects driven by propaganda) in times when they could have had a better use. A case in point is the Maya collapse, where climate-induced crop failures were initially met by an upsurge in temple-construction.

A more straight forward dysfunctional reaction is harder pressure from the rulers on the population in an attempt to uphold their incomes when the total production is falling. A clear example comes from Black Death and its consequences in Europe. A feudal reaction was released, with a period of plunder by groups among the nobility (the Hundred Years War is just one of these conflicts). A clear example is building activity in Sweden. After 1350 it plummeted almost completely. It was a total halt in the erection of new buildings, from small wooden houses to big cathedrals. Yet one type of building was on the rise after the Black Death: more castles were built to extract taxes and rents.[92]

In a structural crisis intense strife over available production is inevitable. Infighting in the upper classes will be reckless: big landowners attacking petty nobility, alliances of higher nobility brutally fighting each other. When violent pressure is directed against the common people, they often start to organize themselves and resist, often in rebellions. War and civil war aggravate the crisis further. As the vicious circle finally gets a grip on the whole society, long term planning is less feasible for the producers. The whole structure starts to fall apart. Decrease feeds itself.

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[92] Myrdal 2011 100–101; Myrdal 2012a 230–231 with diagrams.

Reconstruction

In a crisis the self-defensive mechanisms of a social structure are weakened – and the power structure is especially threatened. On the one hand, this is a prerequisite for a reconstruction; on the other hand, it could lead to a turmoil that goes over into a loss of many fundamental societal capacities, such as protection, cooperation, labour division, etc. A long period of decline could follow.

The western Roman empire often serves as the typical example. An impressive living standard in urban areas was totally wiped out (amphitheatres, aqueducts, markets, roads, etc.), an affluence that demanded hard extortion of the countryside and subjugated people. In a society with low productivity a vast geographical supply region is needed to support a large city, compared with the industrial epoch where many large cities could be supplied because agriculture had high productivity. Rome was supported with food from many provinces along the shores of the Mediterranean, and also a number of other cities had to be supported.[93] After the collapse, this pressure on the countryside was lifted; nevertheless, the breakdown of a functioning social structure diminished quality of life for many. In western Europe a total and longstanding collapse later tipped over into a new type of socio-political structure.

A very important characteristic for a crisis going over into a reconstructive phase is a shift in the balance between rulers and ruled caused by large popular rebellions where lower classes and subjugated people are gaining ground. Such social clashes do occur in all periods, but they tend to cluster to crisis-reconstruction phases (see above).

In a reconstructive phase the social structure tends to be purged of wasteful elements, which is a result of both decreasing production and the shift of balance in favour of the masses, so that less of the surplus production remains in the hands of the rulers (to be spent on conspicuous consumption or military adventures). This is analogous the technical shift to more efficient production (see above). The social super-structure, the state and the ruling class, is slimmed down, but other segments

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[93] Myrdal 2012b 46–49 gives an estimation of the catchment area for grain sent to Rome in the first century CE, and also for the catchment area in China for Beijing in the Ming dynasty. My goal was to show that in periods with a low average productivity in agriculture, an empire, or a large supporting trade region, is needed to sustain a really big city.

of the social system also tend to be more efficient, for instance setting up contracts, organizing trade, etc. Fever people have to manage more.

A profound part of reconstruction is a reconciliation of the rulers and the ruled after hard conflicts, and especially if the lower classes have been relatively successful. This normally entails new ways of negotiating class conflicts, which could take the form of arenas such as parliaments, or new law codes, or the state administration taking needs of the population into account. The societal ideology tends to accept contradictions and at the same time accentuate a general social concord.

We have to take a moment to consider the Rule. Different paths are possible, and they can diverge and converge over time. For instance, in Late Medieval Europe the inception of a strong state (a legitimate state) included diverse forms of parliaments, and these served as a base for the more unitary form of democratic national assemblies in modern times. In China, it was instead a bureaucracy that increasingly took the demands of the common people into account.

An interesting side effect of the tendency to reconciliation is the merging of elite and popular culture (I will return to this in the chapter on the history of the mind). The populace is not void of intellectual capacity, and popular culture is always in contact with elite culture, but during a reconstructive phase these contacts intensify. This has been well studied for Europe. During the Late Middle Ages, folk culture, especially the burlesque, spread to higher echelons. In the next phase, during the Early Modern period, elite and folk culture again split. Artistic and intellectual endeavours were separated from the culture of the masses. The next period of close contact came in the eighteenth century. The intellectual elite started to collect knowledge among the working population (the French Encyclopaedia for instance), with the intention of promoting the economy. Indeed, the economic enlightenment entailed ideas of educating the masses, which is the other side of this rapprochement. Such flows of influences between folk culture and elite culture can also be identified in other parts of the world, and they often went along with periods with a shift in the power balance in favour of the masses.[94]

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[94] I have spent quite some time studying this process with the help of illuminated manuscripts, see for instance Myrdal 2006c, but also other sources, such as proverbs or miracle stories.

These periods of cultural exchange can be seen as an important part of the reconstruction as they tend to open the way for common intellectual arenas between those at the top and those below.

An intriguing but insufficiently studied consequence could be periods of conservationist ideas as parts of reconstructive phases. In a micro-study of a region in Spain in comparison with the Mediterranean, Karl Butzer showed that conservationist ideas, about preserving nature with terraces etc., often followed periods of intensity and land degradation.[95] If this hypothesis is applicable to other regions it would give a further dimension to phases of stagnation and reconstruction. It also connects to another set of ideas regarding the use of common pool resources. Overutilization is nothing inevitable (the so called "tragedy of the commons"), as negotiations could establish new rules and behaviours preserving natural resources.

It has been observed that hunter-gathers and farmers using extensive technology, such as swidden, developed sustainable management, which does not follow as a corollary of low productivity. People in sparsely populated regions can cause environmental destruction by burning, unsustainable hunting, etc. A conservationist ideology is nothing innate in hunting and gathering societies. Instead, we have to understand such sustainable mentality as the result of earlier misconduct. Presumably such behaviour developed as parts of reconstructive phases very early on.

A further consequence of a reconstructive phase is a relative growth of the secondary sector (because labour productivity in in the primary sector increases). One effect is an increased general consumption of luxury goods, often transforming some of the luxury to everyday objects for a middle class. Welfare for the lower classes merges with the effects of a technological change, where (as we remember from the foregoing section) a main tendency during a crisis is more efficient production. Social and geographical division of labour is further developed when luxury becomes available for the broad masses (such as textiles in European Late Middle Ages, or tea in China). This is a kind of preparation for the next rise in intensity, the next period of changes in technological complexes, which then occurs from a higher level of the social division of labour.

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[95] Butzer 1990.

Socio-political world systems

Some basic criteria

So far, we have mostly rummaged around on the regional and national levels, which is of course crucial to understanding social structure. This is the geographical unit into which it is formed. But now we turn to the larger spatial picture, world systems. A fundamental assertion in the theory kit is that world systems exist and they covered vast tracts of the continents.

Socio-political world systems consisting of a few elements is a new idea about how the world has been structured though the idea is implicit in much of the literature.[96] Geopolitics is a research field of its own, with a number of interesting observations, but no one has sketched the world systems in the way I intend to do.[97]

According to the theory kit, socio-political world systems were formed basically along the same principles. They contained fewer elements in common than regional systems, have more generalized elements and represented a continuity in world history. To reiterate using a few points, the core criteria are:

+ The division always concerns a specific aspect, such as agriculture, religion etc.
+ Every world system contains few elements (compared with regional systems, though these few elements are common for all regional systems in a world system)
+ World systems partly overlap other world systems, but there is no complete geographical correspondence.

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[96] Much of the literature has empires and core-periphery at the centre of attention – but here the empire is seen as just one option among functional polities (see below). The core does not always dominate, neither in trade nor diffusion of ideas: see sections abut diffusion and the Appendix on trade.

[97] Grataloup 2007 is quite inspiring, especially concerning the natural conditions for the forming of polities, for a textbook that gives a short survey over this field see Agnew 2003.

+ All world systems are integrated with other aspects, so that an agricultural world system is also related to socio-political world systems, and so on.

+ The main division into a specific kind of world system has a long lifetime once it has emerged, but it will eventually perish.

As previously explained, the few number of elements in a world system implies that it cannot be understood without relating the specific system to world systems regarding other aspects, but this is totally different from trying to construct a "culture" where all these aspects are contained in one entity. The aspect in focus below will be socio-political systems. In world history, "civilizations" (or "cultures") are routinely used as categories. This may often be a necessary generalization, a sketch, but I want to underline the difference from socio-political systems.

No total "civilizations"

Discussing major socio-political systems demands a demarcation against theories about "civilizations". Identifying cultural differences and how they cluster has a factual base. But to transform this notion about cultural differences into specific and coherent world civilizations leads the scholar into a quagmire, and divisions and suggestions about "civilizations" vary considerably.[98]

The main problem with these systems is that they include too many features into one mould: political forms, religions, ideologies, cultural habits, language, and so on. In reality all these phenomena only correspond partially. The European socio-political system covers two major agricultural systems (in the south and the north-west), and two or three major religions, and so on. All attempts to identify total cultures have ended up knocking down a square peg into a round hole. We can use them as vague concepts: European, South Asian, but not really as analytical tools.[99]

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[98] For a list of six different suggestions see Melko 1995 34–38. For a comparison between Spengler and Toynbee see Manning 2003: 39–43. Fernández-Armesto 2000 18–19 questions these ideas in an amusing and insightful way, and Tilly 1984:99 is even harsher in his condemnation of them.

[99] A common metaphor in earlier literature was to describe these civilizations as an organism. They were born, grew up and eventually died. I regard this as mere poetry, and the explanatory value is limited. In fact, if it is taken as a part of an analysis it would lure the scholar down very dangerous paths. Another uncanny tendency, not uncommon in today's world politics, is to place religion at the core. This transforms the idea about a total culture into an instrument of oppression against minorities, as ideas about "race" did.

However, all world systems have to be understood in relation to other kinds of world systems, and this gives a weak empirical foundation for the scholarly discussion about civilizations and cultures. There is a link between agricultural systems, socio-political systems, belief patterns, major languages among other aspects in a complex grid. This has to be analysed as interactions between different kinds of world systems.

An even more problematic aspect of identifying such total cultures is an ideological aspect. Emphasizing the totality is often combined with an overestimated value of the totality, of "my culture". As an overarching simplification, we can be allowed to talk about a Chinese culture, European culture, etc., but one must be aware of the dangers in stressing this as the most important categorization.

I stand on the shoulders of those who have theorized about civilizations, not only to trample upon them, but also to benefit from their observations. Some of these scholars, such as Oswald Spengler, are nearly useless; others like Toynbee have many interesting observations, not the least in emphasizing non-European history. One that I consider very interesting, though with some strange ideas, is Pitirim Sorokin, and he also developed a method to test his ideas against hard data.[100] A scholar I feel acquainted with is Fernand Braudel, especially his book that, in French, has the striking title: "Grammar of civilizations".[101] The idea of a grammar inflecting diverse aspects of the culture is close to the theory kit. Braudel does not explicate on his title, but it is like the name of a painting that gives a key to understanding it.

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[100] The abridged volume of Sorokin 1957 is not sufficient; one has to work with the four volume Sorokin 1937–1941 where all the methodological and source critical problems are presented. In a volume on macrohistorians edited by Johan Galtung and Sohail Inayatullah the introduction explained an appreciation of Sorokin compared to other world historians of that epoch, Galtung & Inayatullah 1997 x. This volume also contains a presentation of the main macrohistorians and their theories. Toynbee is interesting, and one of his most important contributions was to influenced a new generation of historical atlases, starting with *Times Atlas of World History* 1978, where the Eurocentric view was abandoned.

[101] Braudel 1987 (first published in an anthology 1963), the English version, Braudel 1993, has "A history of civilizations" as the title, probably because the translator did not catch the idea with an unexplained title.

The Marxist tripartite scheme

Approaching the grand history of social change makes it interesting to discuss the Marxian tripartite scheme slavery-feudalism-capitalism – and eventually socialism. These are seen as successive stages history has to pass, and one can conclude that this is obviously against the Rule, as several possibilities are nearly always at hand. Here I want to cut this Marxian Knot, the tripartite scheme, by separating feudalism and capitalism, placing them on different levels. One of them is a major period in human history (capital being of prime importance for the social structure), the other is a world system: European feudalism.

On a very general level one could argue that the Marxist scheme represents some form of reality. As mentioned, the social structure tends to be organized around the most important long-term investments, or rather where most labour is used, though in societies beyond the hunter-gatherer stage invested labour (saved labour) normally entails the largest part of labour. Control of this category – invested labour – is absolutely fundamental for the power structure, and is how surplus production is transferred to the upper classes.

Labour investment can be divided into major categories: human labour (breeding and feeding), and investments in land, and investments in capital proper (movable as livestock or machinery, or immobile as buildings).[102] A fourth category is investments in human skill, which is thus something other than investments in humans as a physical labour-force.

From a such generalized perspective, one could talk about different types of societies where one of these main categories of long-term investments is the most important, and which then clothes the power structure. From a bird's eyes view they form a sequence, and the Marxist terminology in this respect has relevance.

The first systems meant control of people as a working force. This could be slave-owning or kin-based societies (where kinfolk were ranked, with some of the higher ranked exploiting those with less status). In a slave society the determining factor is not that the slaves were a majority (they seldom were), but that they were the most important asset for the upper class to extract surplus, and thus fundamental for the

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[102] An alternative term is "physical capital" but as slaves also are physical I avoid that term as being too relevant just for the modern period.

power structure. Investments in humans as physical objects (raise or raid and then control) forms the core capital.

The earliest large-scale investments outside humans were in transforming the landscape: investments in land ("landesque capital"). Control over land then formed the foundation for the ruling class. (Feudalism is not a well-found term; it has an analytical, more productive use, see below). "Land-owning societies" gives a more correct connotation. (A variant is societies where livestock is the most important capital, but in these societies also pastures have a decisive role.)

Capitalism is an appropriate term for the modern world. Industrialism also has another effect, which I discuss in Appendix C: the enormous capacity for material production, and the societal necessity for this type of production, as this is what machinery is good at.

For a fourth and possible future major category I suggested skill, which is different from physical labour. Control of skill, and acquiring skills has been of importance in all history, but it could be that we are facing a new and fundamental role for this. My assumption is that this will not only relate to intellectual fields, but to all proficiency including arts and craft. If material appropriation (producing as much matter as possible) is falling behind as the ultimately dominating goal (and if many simpler activities can be performed by machinery), then skill being built up over years by individuals could be of profound importance. However, other alternative (less delightful) are possible.

These major categories are sequential to some extent, but with a sliding transition and with many remaining or emerging elements existing under the dominant form. Land-owning societies are replaced by capitalist societies because of technical change. Slavery or kin-controlled societies normally precede land-owning, as the latter emerges with large scale investments in landesque capital.

These very broad categories only offer a preliminary interpretation of the large-scale social change. A deeper analysis demands that different aspects are considered, and that a world system classification, as used in this theory kit, is applied. In this text feudalism will be regarded as a world system in the period when land-owning societies dominated. This is presented in figure 2.

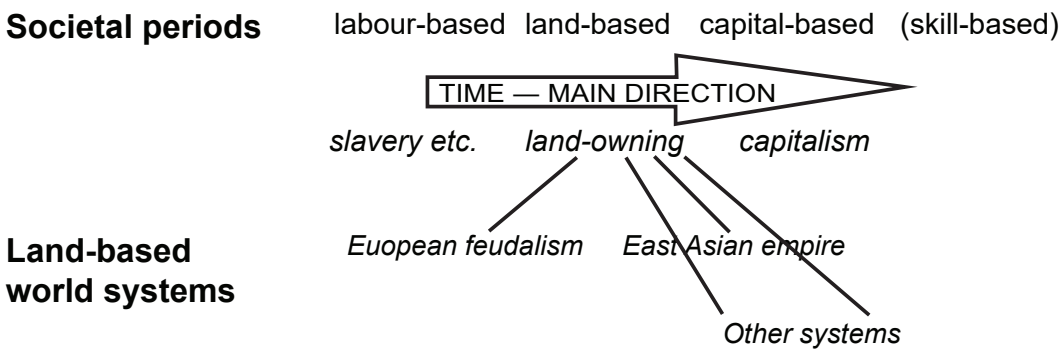

Figure 2. A new relationship between "capitalist" and "feudal" systems, placing them on different levels. Observe that periods could overlap each other – and that different world systems also exist during the other major periods, such as under capitalism.

Socio-political world systems

I have chosen the socio-political aspect as the most salient for a world system analysis of the social sphere, that is elements related to the state combined with the hierarchical structure of a society. The state is a warranty for the whole fabric of society, and the hierarchy forms a core of the social system. Other aspects could have been chosen, such as different family systems (I will come back to that).

In a complex society many of the threads in the social order are entangled with the state and hierarchy, and regional subsystems have elements related to legislation, institutions, etc. For obvious reasons the socio-political subsystems are linked to nations and empires. The socio-economic relations, how production is organized and its products distributed, is of specific importance to understand regional systems, as it is connected to the material sphere and to the ratio of forces between different social strata. These settings could vary considerably within a world system consisting of generalized socio-political elements.

Medieval Europe is a case in point. In a rather uniform socio-political system, the economic structure varied between regions so we find a free peasantry not only in the peasant republics, but also in large tracts of Scandinavia. But in other parts, with a similar overarching system of state and transferred power (see below), we find manorialism, such as in parts of France and England.

A common socio-political system is spread by chains of influences between states, in warlike and peaceful contacts. Ideology, trade and flows of people (not the least in the upper classes) shapes a common understanding of and relation to socio-political fundaments for a society.

States often emulate their neighbouring states, not only through belligerent contacts, and one can identify groups of states caught up in intensive flows of influence – like England and France, or the Scandinavian kingdoms. The impact stretches into state organization, use of symbols, ceremonies, and other building blocks in a socio-political system. The socio-political system is shaped and spreads differently than an agricultural world system, as it is built much more consciously.

My description below of socio-political world systems is less grounded in data collection than my description of the agricultural world systems, and it mere a sketch rather than a firm description.

European feudalism

The discussion. I start with the part of the world best known to me, Europe. As the term "feudalism" has been liberated from the Marxian tripartite scheme, and replaced by "land-owning societies", it can now be applied to a specific European socio-political world system. Two miscalculations have to be confronted.

Scholars accustomed to the European pattern (especially adherents to the strict tripartite idea) have tried to find similarities in other parts of the world, and indeed found some traces, for instance in Japan, but the attempt to extend traces to a whole system have been misapplied. We know from the agricultural systems that single elements can occur in many places of the world, but this is not the same as them being the whole world system. Feudalism is situated in a European context.[103]

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[103] Bloch 1962 is still among the best texts. Many adherents, especially Marxists, tend to emphasize oppression and exploitation as an indispensable part of feudalism, but that is to overlook that every system could contain a gradation of freedom and subjugation. In fact, the European world system opens up for much popular influence. Otto Brunner has written an interesting overview in the encyclopaedia *Geshichtliche Grundbegriffe*, Brunner 2004 (1975).

On the opposite side, we have those who claim that feudalism never existed in Europe, and even that using this term is detrimental for historical research. Europe in the Middle Ages displayed a number of similarities: a catholic church ruled; a legal tradition emerged where contracts had a crucial role; a military class was rewarded with landholding (which they came to consider as real properties); towns were rather independent and served the countryside as a whole with trade and crafts (and not primarily not as centres for state administration); and villages inhabited by nuclear families (though kin indeed continued to be important). Someone travelling far and wide over the continent would have recognized the basic social structure everywhere, but if he or she went outside Europe social patterns would have appeared to be strange. We need a term for this specific European pattern, and a term is at hand: feudalism.

Many of the scholars who declare that this term is utterly wrong, that it should not be used at all, are barking up the wrong tree, as they are attacking an old-fashioned use of the term: the formalistic juridical. A front figure is Susan Reynolds. In her book, that the other scholars who despise the term refer to, she declares that her discussion only concerns the vassalage, and she has excluded relations between peasants and lords and many other societal components. She discusses the difference between property and fiefs, and talks about all diverse systems in Europe, but in the end she admits that many crucial changes came around the eleventh century all over Europe. In a second book she has treated collective and cooperative actions, and again concludes that these were similar all over Europe, and often marked by a strong role for local communities. She overtly avoids presenting a new conclusive model.[104] I cannot see why others should be banned such models. We have common patterns in Europe that ask to be conceptualized.

Feudalism as European world system. In the appropriation of the concept for the European socio-political world system, firstly, I declare a total disregard for the popular and metaphorical meaning of *feudal* as something both backward and atrocious. In fact, this system has been very productive and functional for the entire society over hundreds of years.

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[104] Reynolds 1994, Reynolds 1997. Many who criticized this concept claim it is vague, or even contested, and thus not useful. These are not relevant arguments. All general terms are contested by some scholars, and to argue over definitions is a part of scholarship.

Turning now to how a socio-political European system was formed, a detailed and elaborate description would demand a discussion about all of the important regional differences, where what is considered as classical feudalism (northern France), is just one variant among others. I am totally against ideas of pure feudalism on the one hand, and more diluted forms on the other; they are all a part of the same socio-political world system.

A fundamental feature was the fragmented state constructed as a complex system of bestowed authority. The dominant part of the upper class was made of military specialists, the nobility which had large parts of their incomes from military functions, so that they were rewarded with fiefs of different kinds and tax-relief. The nobility had tax-free land, feoffed from the state or as private property (which often merged).

The peculiarity stands out more clearly if one looks at this from a Chinese perspective, where the European military leaders can be described as war-lords, fragmentizing the state. The nobility in Europe looked at this differently, and saw themselves in a matrix of relations that upheld the function of the state.

The religious organization, the Catholic church, was separate from the state, and just because of that, could be supranational. A thorough organization across nearly all of Europe controlled minds and land down to the village level, with many mighty branches, especially the monastic orders. The whole structure was formally under supervision of the Pope in Rome, but ensuing from the overall power-fragmentation, specific units, such as universities, could be quite self-governing. (The Orthodox church was organized in a less top-down fashion.) The church had the same freedom from tax as the nobility, as a consequence of this general fragmentation of the power structure.

Transferred power also gave room for localized power centres, so that some regions could have a manorial structure with legal powers bestowed to the lord, and other regions could have strong village communities organizing production. This fragmentation also allowed political structures such as "peasant republics" in the Alps, along the North Sea coast and in the Pyrenees that existed in the overall socio-political system for centuries. They have similarities with the "maroon" societies in America, built by runaway slaves, but the European peasant republics were much more integrated into a total political web.

Akin to this were the self-governed towns, which were both integrated into the feudal, fragmented political structure, and at the same time political entities with often far-reaching self-government and even separate legal codices and jurisdiction.

The whole web of complex and partly counter-acting power-structure was held together by a set of legal ideas, partly inherited from the late Roman Empire, and partly further elaborated in different parts of Europe during the High Middle Ages. This was a process interrelated with the establishment of the European-wide church and its ideological paradigm. A fundamental aspect was that contracts between individuals and groups, based on negotiations, gave stability to the structure and formed a prerequisite for the cohesion of the fragmented power structure.

This legalism (to borrow a term from Chinese history) permeated all of Europe, but appeared in different forms, such as the national codecs in northern Europe, the pseudo-national (private) in Germany, the many interrelated local law-codecs in France, the elaborated praxis-system in England, and so on. Common to them all was that the entire population, from kings and lords to ordinary peasants, looked upon these laws as firm creations to adhere to (or to evade in a crooked way).

Landholding was the basis of power, as in all agricultural societies. As previously mentioned, the socio-economic structure could look quite different within feudalism. Across the entire spectrum, from dominating manorialism to regions dominated by free peasants, the same ideologies about contracts and landholding as a social relation prevailed. How surplus was transferred from the producers to the upper classes – the nobility and the higher clergy (note that the village priest cannot be regarded as a part of the upper class, though he received tithe from the peasants for his service) – was determined by a convoluted crisscross of taxes and rents and other assets controlled by the higher classes. The peasants and other lower social strata were not without influence on these matters.

Nationalized feudalism from the sixteenth century. European feudalism went through a major landslide in the Early Modern period, but this was new wine in old wineskins – the basic structure remained much the same. The state apparatus strengthened its positions. A military class was still ruling the society, but was increasingly nationalized and integrated into a state bureaucracy. The church was still rather free, but also included into the state (more so in Protestant countries than in the Catholic), and lost its Pan-European and dominant role. Cities lost their free position as polities, but remained centres for crafts and trade, where craftsmen and merchants kept some authority by guilds and city councils. On

the village level peasants gradually strengthened their positions, by relating more directly to the state (but in Eastern Europe they instead lost out, because the balance of forces went against them).

The feudal system remained, but the states (in most regions) started to take control of the power structure, and a kind of state organized feudalism, "state feudalism", took form.[105] Though fragmentation of authority was gradually abolished, many traits from the former structure endured. This world system persisted for a long period, comprising regional transformations and even revolutions, though in the end a capitalist world erased the feudal system in Europe.

Other socio-political world systems

On a geographically overarching level all of Eurasia can be divided into a few socio-political world systems, similar in many respects but differing in other, converging and diverging over time. Here they are not given definite labels, similar to "feudalism", and these descriptions are also more superficial than the one for Europe, but are of course based on extensive reading of secondary literature.[106]

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[105] I have used the concept "state feudalism" in a number of publications, such as Myrdal 1999b 210–218, Myrdal 2011 101–102. I considered it to be a late stage of the feudal period, before this world system was transformed into something else. The idea, which is not elaborated upon here, is that systems reach higher stages of organization, before being transformed, and "state capitalism" could be seen as a last stage of capitalism. However, the world systems did differ and European state feudalism also made this system more akin to that which dominated in East Asia.

[106] The description of socio-political world systems is to some extent a side-effect of working with the agricultural world systems, where I surveyed much regional literature. Historical Atlases are an important secondary source, and I have used them to study trade and size of states, as well as the socio-political world systems. I consulted the best among world historians, such as Braudel and the McNeils. An aspect-rich and somewhat underestimated scholar is Jones (1981, 1988). *The Cambridge World History* 2015 is important, though it could have been a more innovative synthesis (contributions from too many authors seldom result in a bold, overarching synthesis). Different volumes of "*The Cambridge History of…*" have been good help for specific regions. Below I will mention some of my favourite scholars.

In *Eastern Asi*a the e*mpire is the model*, both among rulers and ruled.[107] The general populace equated the empire with stability, order and economic progress. When the empire collapsed, the ensuing crisis often became a major disaster, not the least because of the scale of conflicts.

This socio-political system came into existence in the centuries before the Common Era, and was well established from c 200 BCE, after centuries of intensive strife between states in what now is Northern China. Thereafter the united empire was also the model during long periods when China split into several states. Other parts of East Asia joined this socio-political model: Korea, and eventually also Japan and Vietnam (after having freed itself from China).

State craft, as discussed in Chinese texts from the middle of the first millennium BCE, recognized a link between a strong economy, a growing population and a robust state with a strong military. In fragmented Europe this was not conceived of until in the sixteenth century when the European trajectory was approaching the Chinese. Thus, Chinese rulers often strived to support, or at least not ruthlessly exploit the broad masses. A kind of social contract existed, expressed in the idea about Heaven's will ("Mandate of Heaven"). Implicit in this idea (which was related to natural disasters, etc.) was the right of revolution. A further consequence is that a new dynasty could be founded by someone from a common origin (which was completely unthinkable in feudal Europe until the end of the eighteenth century).

Several socio-economic systems were contained within this overarching world system, and looking at mainland China reveals a difference in development between the original centre in the north and the south when the gravity of population shifted south together with an enormous expansion of paddy rice. Great land owners, and a manorial and clan-based society, came to dominate in these regions, whereas in the north nuclear families and village organizations played a more important role instead (from the Han dynasty).

However, there is no direct link between agricultural practice and the way society was organized. In the north an earlier manorial structure was replaced by

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[107] Wolfram Eberhard is my favourite historian writing about China, in for instance his general history (1977), and a series of other books, but especially his enormous works on the fringes of the empire. A long row of other scholars could be mentioned, but I am especially fond of *The Cambridge History of China*, a series of volumes where chapters could be read as one novel after the other. For Japan, my favourite is William Wayne Farris, for instance his overview 2009. For Korea, Lee 1984 is still a very good overview.

villages as the state grew in importance from the centuries around the beginning of our era. Paddy fields do indeed need cooperation; managing the polders was done by communities. The type of agriculture is one factor, but the ratio of forces in social struggles and other historical factors play a decisive role. In the south the expansion of the Han people meant they merged with the many clan-based people already living there, and this is a factor behind the differences between the north and the south.

As in all world systems, the East Asian empire went through major transformations. In China during the Late Middle Ages and the Early Modern Period the entire state organization was reorganized (slimmed down and made more efficient).

The comparison between far west and far east is illuminating. From China's perspective, Europe developed as if warlords during periods of political collapse could have taken over and reigned forever. From a European perspective, China's history looks as if rulers with hegemonic aspirations, like the Habsburgs or Napoleon, could have succeeded and suppressed all nations in the long run. Both are right and wrong: we face two different solutions.

The European system did converge towards the East Asian model, though along its own path, with the stronger states in the Early Modern period. Some attempts to establish a progressive, "enlightened" despotism in the eighteenth century failed as they did not stand up to the competition from the much more efficient and legitimate system developed firstly as an incipient and then finally as a fully developed democracy. In China the state was (and is) well aware of its dependence on the masses, and today this specific capitalist world system (disguised as "communism") is heavily marked by the pre-industrial system that reigned for millennia.

Note that the East Asian socio-political world system is totally different from Wittfogel's infamous Oriental Despotism. Firstly, there is no absolute link between a "hydraulic" society and the building of an empire. We have already noticed that large scale water-management can be handled in totally different social structures (the Netherlands and China).[108] Secondly, for a long time the East Asian system was

[108] Wittfogel 1981, and in Myrdal 2014 a thorough survey and comparison between large scale water-management in China and the Low Countries showed that these enormous projects could be organized in totally different societal contexts (the Rule).

more concerned about the welfare and life of the common people than many of the brutal despotic systems in other regions of Eurasia.

Islands of state control in the woodlands (and Deccan). In a belt over South Asia and South-East Asia, from southern India to the archipelago in Indonesia and the Philippines, the dominant socio-political system was comprised of core areas with strict state control surrounded by vast tracts of pre-state organizations, which related to the agricultural world systems (intensive wet rice and swidden). In fact, the socio-political system steered much of how agriculture was performed, in a two-way interaction so that the agricultural systems formed a basis for this socio-political system. (I intend to further explore how this specific combination evolved in a report on the agricultural systems in eastern and south-eastern Asia.)

I have combined the intensive and extensive into one system (whereas in the section on world agricultural systems they are separated, with kingdoms as a proxy for intensive wet rice), as states seldom came into being outside the core areas.[109] Woodlands were under no or light state control. Swidden farmers were movable, and their root crops were difficult to tax. On the flip side, this meant people lacked protection.

The core areas could demand hard oppression (even slavery), and to some extent control of human labour was as important as control of land. Flight from the woodlands was an option, and from later periods we know that a family in Southeast Asia could shift from wet rice farming to a swidden, and often practiced both. (A relationship between shortage of labour and slavery has been shown for many periods, such as in the Old South of the US.)

In southern India the Deccan was a part of this socio-political world system for long periods, with intensive cores and large areas with more extensive land use, loosely controlled by a state, but with less hard oppression in the core areas, and more investments in land (dams) in the periphery.

Yet a concentration of people into a small area could also be an aim for protection, where large tracts of deserted land were dangerous for a small group as they could

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[109] For Southeast Asia two important scholars are Kenneth Hall (2011) and James Scott (2009). Hall reveals the links between agriculture, trade and statecraft. James Scott analyses relations between cores with strong states and the large tracts of surrounding woodlands. I am very fascinated by historical atlases as an analytical tool and South Asia, including Southeast Asia, has been bestowed with one of the best atlases: Schwartzberg 1978. My favourite historians for South Asia often have an agrarian inclination, such as Ludden 1999, Stein 1998 and Eaton 2010.

easily be attacked. This was common in many pre-state societies, and we find it regularly in archaeological contexts, for instance in prehistoric Europe. It was also common in West Africa, where slave hunters were a constant threat in the Early Modern period (and to some extent also earlier).

When woodlands were embraced by more peaceful and negotiated historical circumstances, people in the woodlands served the core with a number of products, often luxury goods and in later periods, goods for long distance export. Craft products went in the other direction, but not necessarily food because swidden farmers were self-sufficient.

This pattern predated the formation of more organized states during the grand transformation in the middle of the first millennium BCE. For instance, in West Asia, the earliest states were islands of state power surrounded by influential areas. In the medieval period this world system had changed and the core states were more organized and controlled larger areas. An important change came as a consequence of the growing importance of long-distance trade of luxury products. The archipelago around the Malacca Sound and Java saw the emergence of thalassocracies with an agrarian upland. All across this system the importance of the woodlands grew during this transformation, as much of the export products came from these areas.

Endemic warfare was a characteristic of this system, and though war causalities were seldom large, the disruption contributed to large, sparsely populated tracts.[110] Sometimes these conflicts totally erased a core area, which then returned to being used extensively without much state control.

A political balance of forces with negotiations, or superior control as in an empire, would solve these problems. The common rule was that these small states were conquered when they had to face stronger states, and thus the Chinese empire had advancing frontiers in the south and south-west, though during periods of political disintegration of the empire the island-system could expand. For instance, a kingdom was established in Yunnan in the ninth century with all the characteristics of the island-system: a core fertile area close to trade routes surrounded by large tracts of extensively used land. The empire-system was pressed back for a time.

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[110] See Henley 2005 for an excellent description of the combination of factors, ongoing wars and diseases, that caused this demographic pattern.

Much of the European colonial expansion occurred in this world system, whereas the East Asian empire-system was more resilient to attack. Colonialism was the expansion of state organized feudalism, in a number of what must be regarded as empires.

Islamic socio-political world system. In West-Asia, including much of Central Asia and the southern shores of the Mediterranean, large states were organized with trade and urbanization as a salient feature.[111] Basically, this was linked to the Islamic religion, but it also influenced other areas such as south Asia (mainly in the north). Rulers draw their legitimacy from their role as protector of the dominant religions (though for a long time this was combined with acceptance of other, repressed religions), and also of trade. The rulers were less bound by a legal framework than in Europe – which underlines the legal structure as something that held fragmented European feudalism together.[112]

This world system on the one hand is rather late, with growth after the seventh century when Islam spread and eventually came to reign along the sea routes from Morocco in the West to Southeast Asian island in the East. On the other hand, it can be described as the successor to the Roman Empire, which to a large extent was built around maritime trade routes and was an urban-centred socio-political system.

Though important, we should not overestimate trade, and in the core regions – West and Central Asia – this both enhanced and eventually limited the expansion.[113] According to the theory kit this has to be related to crisis and infighting tendencies, hampering long term expansion.

In the Late Medieval period, most of this world system was transformed partly because of a new technology: firearms. So-called gunpowder empires emerged, where centralized states had nearly total control of a huge army. The military revolution did occur all over Eurasia, and was combined with a stronger state apparatus: in most of Europe, resulting in state feudalism, and in China, the reformed empire (as well as in Korea and Japan).[114]

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[111] In world history literature, it is often remarked that Islamic culture encouraged and protected trade, for instance Jones 1981 178. Further literature is mentioned in Appendix A, and see also for instance Chaudhuri 1985 about Islamic trade. The multivolume *History of Civilizations in Central Asia* vol 4–5 (1998–2003) is a work of the same quality as the best "The Cambridge History of ..".

[112] Jones 1988 xliv also gives this aspect. More in-depth analysis in Kuran 2011.

[113] One of the most interesting studies about this is Christensen 1993.

[114] For a survey of these theories and their relationship to general tendencies in Eurasia see Andrade 2016.

A number of factors, besides developments of military technology, contributed to the rise of a strong and efficient state, one such being the general drift towards increased social complexity. Around the thirteenth century, the broad belt over Eurasia around the 40th latitude, the belt of civilizations, was hit by nomadic invasions and lethal pandemics. A period of deep crisis opened the way to reforms, and in the reconstructive phase, long distance trade was boosted which further strengthened a shift to more embracing political entities.

Specific to this socio-political world system, compared with the ones dominating in the west and east, was the lack of large-scale popular rebellions in the Late Middle Ages. A new state apparatus was not as sensible to the masses as in Europe and China, and a hard autocracy became the model, which in the long run hampered economic and technical change.

Islands of state control in Central Asia. A variant of the intensive spots surrounded by more extensive areas were the oases, or irrigated rivers, surrounded by extensive pastures. Though this pattern is akin to the Southeast Asian system of intensive islands in a sea of extensive use the differences are so marked that the Central Asian variant must be regarded as distinct.[115] The main difference is that in Central Asia states, strong and expansive, emerged in the extensive areas, see below

As mentioned in the section about agricultural systems, interdependence between intensive agriculture and extensive livestock-breeding was a necessity, especially for the nomads who needed both agricultural products and products from crafts that could only be produced in a sedentary society. The core regions received products from animal husbandry, but also protection along the trade routes – and armed forces (see below).

The oasis could dominate larger tracts of extensive use, and then the area included in these socio-political units were much larger than just the irrigated and intensively utilized area. When these smaller polities were united into larger units, this often turned them into an Islamic pattern. If they were included into nomadic empires they instead belonged to the next category.

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[115] See literature mentioned in earlier footnotes. One comment is that Scott 2009 pointed at similarities with the step-and-oasis system. This is correct to a point, but there are crucial differences, mainly because pastoralists and swidden farmers have totally different impacts on state building.

Nomadic states. On the Eurasian steppes and in other parts of Central Asia, the socio-political world system was based on the military power of nomadic tribes. Such states were organized around the armed forces, with the cavalry as the core units. The extreme orderliness of these forces is amazing. In the thirteenth century the Mongolian empire transformed a tribal society into an efficient armed force. Even before that, the nomadic cavalry was a frightful adversary to sedentary societies. It was not until the eighteenth century and the spread of world-wide agrarian expansion and the arrival of disciplined armies with firearms that nomadic warriors could be ultimately defeated and their areas conquered (mainly by Russia and China).

Mercenary troops taking over the country they are paid to protect is a common phenomenon all over the world, however, in the regions dominated by pastoral nomads this developed into the typical pattern during the Middle Ages. Nomadic empires rested on brutal force, but were also multicultural and opened the world for trade and cross-cultural influences along the inland routes over Eurasia – similarly to how European empires were organized by the sea routes some hundred years later (to regard "colonialism" as a unique experience in history is a Eurocentrism which I try to avoid).

Capitalist world-systems

The end of the eighteen and the nineteenth centuries experienced a structural change so that the feudal system was relegated to the ash heap of history. Land-owning as the power base was replaced by control of capital proper (machinery, railways, plants, etc.). A landslide transformation of social structure followed. Nearly every component along the social web changed.

One of components in the new socio-political structure in Europe was a more direct relationship between the ruled and rulers, giving the people means of control over the state, which also shaped the fundamental legitimacy enhancing the transformation. A new level of legitimate state and largely accepted social structure was the result, based on democracy, a free critical press, popular organizations of diverse kinds, etc. What happened was a transformation that spread over the globe. We should not simply regard it as a change instigated by Europe. All nations took part.

A consequence of capitalism as an overarching category is that the "real socialist" countries can be regarded as one of the socio-political world systems in our

epoch.[116] Presumably a deeper analysis of the contemporary period would show several world systems, but enough have been said about a period which is beyond the scope of this text.

The long history of states

States did not look the same throughout history and followed the general trend of evolving towards more complex social structures. A comprehensive study of the world history of the state is far beyond my undertaking, but in a rather restricted study, I used area and population controlled by states. Besides assessing social complexity, I also wanted to estimate the role of empires as their role has generally been overestimated. The capacity for managing vast geographical regions is related to the establishment of a transport infrastructure comprising of roads, bridges, harbours and so on, combined with efficient bureaucracy and military. To steer a large population, the state needs to interact with the entire fabric of society, as discussed above in the discussion on functionality. Assuming that social complexity increased with a rising population, the relative proportion of the world population organized under the state indicates how this supreme body came to play a central role in societies.[117]

Area is rather easier to calculate, as this has been a main issue for historians. My study was based on a set of historical atlases from around 2000. Population size is a better indication of how a state handled social complexity, but the available literature is a drawback. It is a pitty that world historians have not been able to make a total survey of the history of world population on national levels since 1978, a survey which even then was made by an amateur.[118]

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[116] Some readers may react negatively to what I've called "real socialist" countries as parts of the capitalist system, but these countries have the same goals (material production) and the same production base (capital as the most important production factor) as the other countries in the overarching capitalist system.
[117] This section is based on Myrdal 2012b and Myrdal 2016. An earlier study of state size was based on historical atlases from the 1960s, but this outdated study is still widely circulated in scholarly literature.
[118] If all those who engage in calculating GNP (gross national product), an information diluted measure, had used their energy to estimate population data (or trade volumes), world history would have taken great strides forward.

The area under state control has been estimated for the three largest states (empires), and for all of the states in the world. A number of source critical aspects (alliances, influence area, etc.). have been taken into account, and hopefully future research will present an improved dataset. The relative proportion of the world's population has been calculated for the two most populous states, with a few estimates of other empires.

The earliest states ascended as early as five thousand years ago, as islands in sea of tribal communities, controlling just a few percent of the globe. The total land mass under states' control then expanded in a few spurts. The first came around the middle of the first millennium BCE, and by around 200 BCE about 10–20% of the entire global surface was under state control. A second increase came around 1000 CE, when the land ruled by states reached about 30%, whereafter a gradual increase of total state control continued. About 40% of the globe was included into states in the fourteenth to the sixteenth century. The steady growth of state control continued from around 1700 with a spurt in the late 19th century. By around 1900 nearly the entire globe was more or less under state administration.

Looking at the largest states, two previously mentioned measurements have been utilized. Spatially, the upsurge for the three largest was dramatic: from around one percent for several millennia, then after a fast increase to approximately ten percent or more c. 500–100 BCE. As the areas under empires were more densely populated than the peripheral regions, this enormous expansion is even more marked when it comes to population. A staggering forty percent of the total world population lived in the two largest empires from c. 200 BCE to 200 CE, and if the third largest is included, this number reaches to more than half the population. This was the time of empires, and the early spurt in state-building was very much formed as large conglomerates.

Thereafter, a long period of stagnating imperial power followed, and when it came to the largest empire's proportion of the world population, it even decreased. After circa 200 CE, approximately just 30% or less of the world population lived in the two largest empires, and even if one or two other very large states are included this proportion, it was less than half.

It is important to note that the increase of total state control around 1000 CE, which was contemporary with large scale changes of agricultural systems (and also of ideologies), was not connected to any relatively increased role for the two or three largest states. The empire was an option, not a destiny.

A new expansion for imperial power came from the Late Middle Ages with the Mongols, and was then mainly a spatial expansion, but from the sixteenth and seventh centuries, the relative proportion of the population in the largest states also increased. A new peak for empires came in the nineteenth century through to the beginning of the twentieth, but over the last fifty years they have been diminishing in importance again.

Three findings are: 1/ a major leap forward in state size came in the second half of the first millennium BCE, highly driven by the forming of empires; 2/ thereafter followed a long period where state control increased, but not the importance of empires; 3/ in the late nineteenth and early twentieth century the whole world came under state control, and again this was partly driven by empires, and thereafter they started to break up (decolonization, the collapse of the Soviet Union).

How can we understand the world systems just described in relation to the long trends of state formation? Let us repeat some of what was said about socio-political world systems:

+ The South and South-East Asian system, with rather small polities surrounded by vast tracts of land outside direct control, evolved directly from the situation before the grand spurt. The East Asian system is a continuation of the Golden Age of empires, and has been the model not only for rulers, but likewise for much of the population.

+ Rome was different from the Han-dynasty. In the East, having masses of people as the basis for the state was a prime concern; in the west, protection of trade to support the centre (or rather the centres, besides Rome itself also Antioch, etc.), was a key issue. West Asia and the Islamic empires can be seen as heirs of the Roman Empire.

+ In Europe fragmented Roman provinces merged with tribal communities outside Rome, and gradually developed into a world system of their own. This process was under way for centuries but matured around 1000 CE, and then a number of polities balanced each other in a complex pattern. Globally, fragmentation was the main tendency around 1000, even in China, and this went alongside economic progress. In the sixteenth century, the common tendency (in Europe as well) was towards more centralization.

+ The world system built by nomads on the steppe of Eurasia had its own momentum, yet interacted closely with other systems. During the first millennium of our Era,

the nomadic military apparatus gradually advanced in striking power, peaking in the twelfth to the fourteenth centuries, and this rise of empires was connected to crisis and population decline.

The upsurge in state organization from the sixteenth century and the following centuries was linked to the growth of long-distance trade over the oceans. Empires based in Europe dominated the world, for a time, but this was only an intermediate stage towards state-organization of the whole world.

Empires are not destiny. When looking at empires that conquered other smaller entities, normally expansion and control implied costs, and at a certain point of enlargement, the exploitation can no longer pay for cost. Overstretch is the most common reason for the demise of empires.[119] This is the human tendency to overstretch, and the paradox is that if an empire (or large state) is curbed, it has better chances of survival.

Future of polities. The Rule invites different options. One is an empire-like control, where some of the states today take the role of world empires, which would hamper attempts to solve urgent problems in the world. Another possibility, also a consequence and part of a deep crisis, would be disintegration (a favourite theme in popular fiction). A third option could be a new set of alliances and agreements.

Other social world systems – family structure

The socio-political aspect is important, though there are others, and one that is nearly of the same magnitude is the family structure and position of women.

The West-European marriage pattern has played a prominent role in world history, and it is often seen as one of the reasons why this part of Eurasia could come to the fore. More than half a century ago Hajnal presented a comparison between

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[119] The literature on empires is overwhelming, and much of it is treating empires as one of the most essential elements in world history. I regard empires as an option, one way to organize states. Collins 1999 39–44 has a theory of overextension, and indeed many scholars has similar ideas. There are ideas of empires always being able to squeeze out surplus from subjugated peoples, which underestimates the agency of oppressed people.

the marriage pattern in Western Europe and other parts of Eurasia.[120] Thereafter, a flow of studies about and references to the West European Marriage Pattern followed. It came to be viewed as Western Europe in contrast with the rest, but in the perspective of the theory kit, this must be a false dichotomy. Several world systems existed, and to look solely at the specific features characteristic of the West European system hampers the view of world history.

The main feature in this pattern was late marriage for both sexes, and in comparison with other parts of the world, women waited ten to fifteen years after menarche until they conceived. Additionally, there are several other elements, such as many living in celibacy, the relatively free choice of mates, etc. This pattern has a number of consequences. One is of flexibility; marriage age could fall in periods of affluence, and rise again during problematic periods. Women's position is also enhanced, and she enters the marriage with more equal status to her husband, being of roughly the same age and having acquired some assets while employed. Work became much more available to females in society as a whole, and women could develop skills and capacities. But to uphold this system, the moral codex must be strict with hard control of sexuality.[121]

It was a great achievement when this pattern was identified, but it is a mistake to regard this as providing a contrast between Europe and the rest. Instead, we have to understand this as one of the world systems among others. The European marriage pattern can be followed back to the Middle Ages, but it is doubtful if it can be traced further back. One prerequisite was a growing labour market in the countryside for young maids and servants. Free choice of mate and the dominant pattern of rather small families are other necessary parts. I reckon that this pattern did not emerge before the Middle Ages, and was presumably not fully developed until in the Late Middle Ages.

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[120] Hajnal wrote his first article 1965 and then he and many other returned to and elaborated on this pattern. In a volume edited by Engelen & Wolf 2005 the historiography is presented and also articles about the pattern in other parts of Eurasia.

[121] van Zanden 2009 has an excellent analysis of what this meant for women's position in his chapter on "girl power". In my own research I pondered how to recognize this pattern, and used miracle stories, which are a juridical source with both age indications and accounts of ordinary people, including children: I compared the age of children, who were sick or had accidents, and their mother's age, and could show that the average age of mothers increased after the Black Death. Before then, Sweden did not follow the West European marriage pattern. The conclusion was that this pattern did not exist before, because then population decrease would have resulted in a lowered average age of mothers giving birth. Instead, the pattern was established, Myrdal 1994. As this is pan-European material, analogous analyses are feasible for other countries.

Mixed farming gave women an important role in the production process (though there is no automatic relation between a prominent role for women and their position in the family). In the social web, women had acquired relative autonomy (compared with other regions). Ideological paradigms portrayed women in a positive way, and also hailed chastity. These factors worked on an over-regional level, and thus these intertwined processes formed a system that was similar over large tracts of Europe. In northern and north-western Europe during the Middle Ages, rural women attained a more central position in producing agrarian products for the market (butter, cheese, textiles).[122]

In anthropology, localized studies about kinship have reached a high level of refinement, but these are seen as patchworks rather than large scale world systems. To move from these studies to a perception of world systems demands quite a lot of registering and sorting: and that would only be a first step, followed by extensively reading historical secondary literature. To detect and distinguish world systems regarding family and women's position is a major task for future research, and it certainly shows that these systems have unique features (such as the late marriage to the north and north-western European system).

Just to indicate that we have to identify several systems I will take a few moments to sketch Asian systems. A paternalistic value-system dominated China. In a volume on family systems in Eurasia Wolf has presented an interesting theory. The state enforced parental authority to maintain control. The empire was the role model for a good government, and the patriarch was a quasi-bureaucrat in the state, paying tribute to the state. This also meant that families strived to produce as many sons as possible, which enhanced population increase.[123] An interesting fact is that the European system moved in a Chinese direction with the absolutist state when the patriarchal family was state-protected, though Europe never came close to the extremity of the East Asian system.

Indeed, there is a great variety of families in China, not the least because young women often were taken as a blend of an extra wife and a servant. Population control existed, for instance with infanticide. The Chinese system, with a strong enlarged family, ruled by a patriarch (and a matriarch) also experienced historical change. If

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[122] Myrdal & Öye 2021.

[123] Wolf 2005. In China the philosophy of statecraft very early identified a large population as an asset for a successful state, an issue I will return to in the report on East and Southeast Asian agricultural history.

we look at the role of the women, in the Middle Ages they were pushed back to the inner sections of the house which detached them from production outside the household, an interaction of social structure and ideology. In a later period in the Yangtse delta, expanding textile production was combined with a strengthened role of women in that sector. [124] However there was no simple causation from economic to social importance.

If we turn to India, joint families dominated but apparently without the extremely strong patriarch. In the Islamic world women's role was very much contained within the house, but among Islamic pastoral nomads this was different. I will stop there, because to pursue this subject at length to be able to sketch the systems in West and Central Asia, in South Asia and so on, would take years of reading.

[124] Bray 1997; Li 1998.

History of the mind

A confession

The credo in this theory kit is that all three spheres interact, and none of them can be seen as the ultimate driving force, though each could be more or less important in specific periods, such as the social transformation being of utmost importance in a period of crisis and reconstruction. Moving on to the third sphere, the mentality sphere, a question arises as to whether it can be analysed in the same way as the two other spheres.

I have researched this sphere less than the other two, and but it is not completely unknown terrain when it comes to primary sources. I have studied folklore (proverbs), art (illuminated manuscripts), and folk religion (miracle stories). Nevertheless, this part of the theory kit is less based in my own research and is also like walking into a minefield of extremely established, elaborated research carried out by experts that can go far beyond the BongoBongo-argument and rightfully claim that prominent information has not been considered or has even been misunderstood.

Scholars working on topics within the history of the mind have no problem considering their own specialty as something that can be studied separately, which is in accordance with the theory kit (I argued that an agricultural technology can be understood as technology before it is related to other systems). Many scholars in the humanities are also clear about the fact that their own area of study is influenced by economy and politics. They can also argue that their field of research has some importance for society at large (albeit with perhaps a tendency to overrate the importance of text and images).

However, they are less inclined to see this sphere as a totality. To them, disparities between art and language, for instance, make any attempt to put everything under the same umbrella an abuse. They are genuinely suspicious of ideas related to an overarching system of collective mentality that encompasses the entire human way of thinking in a specific period and part of the world.

Below, I will not even sketch world systems in the history of mind, but restrict myself to arguing that they existed. Showing the differences between this sphere and the other two is paramount because otherwise one cannot argue that there are similarities. From this, I then move on and discuss the long history, here described as a series of "axial ages".

The chain of reasoning

The history of the mind is more *fluid* and *varied* than in the other spheres of human history. These fundamental characteristics go back to the human particularity as explained when the premises for this theory kit were laid out. Our way of thinking constantly crosses borders and makes odd combinations. To think what is not, to fantasize and let the mind stroll freely, is a propensity for all humans. In our minds, we have fewer restrictions than in the natural environment or social context.

Practical intelligence is restricted by hard realities, and as argued this sharpens the mind to find solutions. In the social sphere solutions have to be found within a strict structure, which is a difficult test of human intelligence. Focussing solely on gossip or grooming (a popular theory among anthropologists) is to underestimate the complexity of social relations, with strategies, contradictions, alliances, and so on and so forth.

But merely by thinking, people can imagine overcoming natural barriers in fantastic and mythical ways (flying is one such a fantasy that has been with us forever). In a fantasy social life people dream about love and success, even if they are without any hope of achieving it. This leads to ideas and feelings that are unrelated to material or social aims – the spiritual universe.

The history of the mind is definitely moulded by the material and social environment. Sagas, art, and religion are all reflections, more or less directly, of the lives people live. Thoughts can fly far and wide, but they often have an aim: to explain, or defend, or even to provide solace – but still with some freedom from restraints. This freedom gives the history of the mind a fluidity and a multifaceted nature not found in the other spheres, which together with variations, has important implications for how to analyse this sphere.

Domains

Compartmentalization of this sphere necessarily has to be somewhat different. Instead of a few dominant sectors, we find a plethora of intersected parts. Subsystems are now not primarily regional, but concern a multitude of aspects: religion, language, etc. For the other spheres I have used the term "sector" for different aspects: agricultural sector, industrial sector etc. Sector is also appropriate for the social sphere, but to use this here would be to conceal the differences. Another term is needed, and I will use *domains*. Though the term "domain" is used differently in other disciplines (biology, mathematics, etc.) the way I use it to describe aspects of ways of thinking is not uncommon.[125]

For instance, religion is seen as a "domain", and several different religions could exist in a region. In the literature domain, different themes and styles coexist in the same place and time. I regard language not only as a tool of communication for all of the other domains, but also one of the domains in its own right when it is regarded as such.

This variegation is combined with the other main propensity: the fluidity which shapes the complete intermingling of all these domains: art can be religion, religion can be philosophy, mores can be folklore, folklore can be music, and so on. Intersections are the norm, borders float, and new subdivisions are ubiquitous. The paradox is that all of these domains could be separated in the minds of people (and scholars). Art is art, though used to express religion.

Regional systems do exist, but do not have the same core position as in the material sphere and in the social sphere. Instead, the domains form the main structure under the overarching world systems (which definitely is spatial). We can conceive of it as a myriad of circles (art, music, etc.) that overlap and form the spiritual culture, the societal mind of people.

Domains are formalized to a greater or lesser extent. Some can be very organized with strictly elaborated elements, whereas others are rather colloquial, with each landing somewhere on a gradated spectrum, of course. A faith could have both well-structured orthodoxy and lenient folk religion.

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[125] See Mithen 1996 142–153. This metaphorical connection between "area" and the intellectual subdivision is also used for instance by "fields" as a term for topics in academia.

Diffusion occurs somewhat differently in this sphere. Flows of influences have the same role, and direct contact is a necessity. Ideas could spread quickly and easily, but are also restricted by the multitude of domains. Some domains developed a strict and consistent form, others did not. The spread of religions can be fairly well delimited; the spread of artistic styles is more amorphous.

Collective mentality

The fluidity and intersectionality of all domains in the way people think means that it becomes impossible to separate specific parts. In the material sphere and in the social sphere, I could take a big chunk of the total, agriculture and the socio-political aspect respectively, but here this is not feasible. Instead, the totality has to be included: the overarching system with domains as subsystems. A different way of categorizing is necessary, but the world systems will still be there. World systems comprising the totality of the human mindset, and note that we are talking about world systems in plural.

The term I will use for this totality is collective mentality, or societal mentality. The societal mentality is then the common "mindset" for all people in a large region existing during very long periods. The mentality is then the common way of thinking, the way people during a given period in a large region think.

I have considered other concepts. A total "mindset", is less suitable, not only because that would separate English terminology from other languages, but also because it is often used to denote the common thinking for a restricted group, such as groupthink among Democrats in the US. To use "world-view" would be too restricted, as the societal mentality also includes feelings and the subconscious. The term searched for equals the German term *Zeitgeist*. "The soul of the time", would be beautiful terminology, but somewhat awkward to handle in discussions, and it does not really sound good in English.

A short historiographical digression is needed. Mentality is used by many in the general way I use it (not least among French historians). The term was popular among historians around the 1980s. However, some scholars tried to give it a more precise meaning. More precise meanings suggested were the denotation of popular culture, or the undercurrents, or the unconscious levels in a culture. Mentality was

even described as an intersection between psychology and cultural history.[126] These suggestions did function well in specific investigations, but they are too restricted for my purpose.

The term was also criticized for hiding class contradictions, with the argument that collective mentality could imply a common groupthink for the upper and the lower classes. Arguing that mentality is a way to avoid discussing class contradictions is beside the point, as everything entails opposites. That is a further reason why I want to avoid using a specific meaning, such as folk culture, because that would hide one of the major pulses in history – the relationship between elite and folk culture.

The spatial form is world systems of mentality, and exactly as in the other spheres, the world system bends the subsystems: religion, moral codices, philosophical paradigms and so on. Elements, such as irrigation or a specific religion, can exist in several world systems, but are adapted. For instance, the Jewish religion, which existed over large parts of the world, was quite different in Europe compared with China or India because of adaption to diverse world systems of mentality.

These taxonomical differences can be explained in a simple figure:

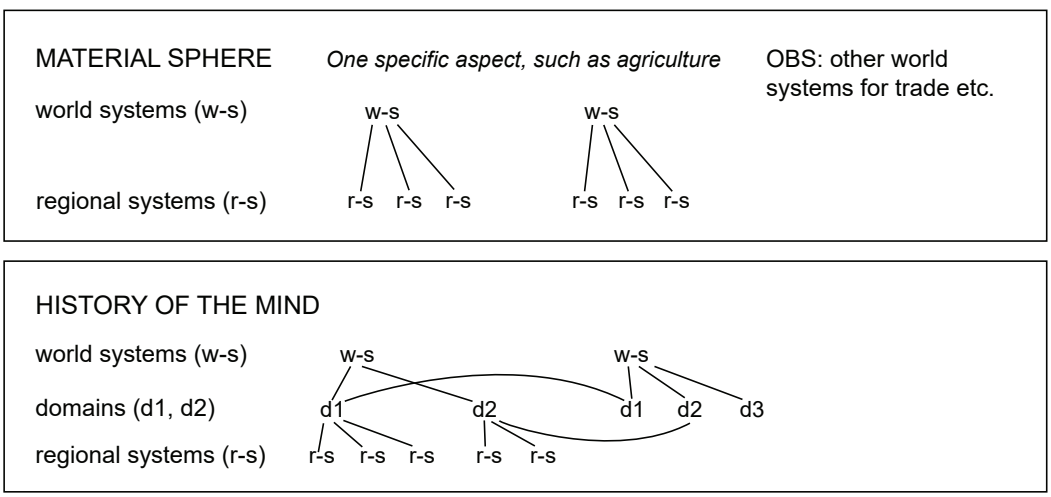

Figure 3. Differences between main categories in two spheres. The different domains are religions, languages and so on. These are subsystems to all world systems, and are also connected to each other beyond the world systems.

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[126] See Ginzburg 1980; Guerevich 1992 40–49.

There are some further consequences. The variegated and multidimensional character, with continuous change along multiple pathways into a floating mass of influences, makes domains amalgamate on the overarching and generalized level, that is on the level of collective and common mentality. The greater unity at top of the spatial systems is counterbalanced by the diversified pattern lower down.

The regional systems do not merge into cohesive grids of combined domains. In agriculture we find rather strict links in a technological complex between elements such as the plough, the harrow, fallow systems and so on. Domains are related, but not joined into a strong system. Regional systems of language and religion, of art and music could overlap, but do not form real systems. We joke about national characters, and that is perfectly permissible, but these cannot be used as analytical categories.

World mentality systems

As I have already confessed, the empirical base for this part of the theory kit is more fragile than for the other parts. Here I restrict myself to arguing that mentality world systems did exist. The next step would be to identify them, and presumably they will be more amorphous than world systems in the other spheres.[127]

Only a small slice can be hinted at, and the focal point will be intellectuals in China and Europe, and the way they thought.[128] Historically, Chinese intellectuals seem to have been less interested in abstract reasoning, and scholarly ambitions were more directed at the concrete and practical. They were less inclined to imagine an almighty God, and thus the "natural laws" were less recognizable (in the West, laws of nature were a deduction from the idea of a supreme God). In China, nature was often conceptualized a more holistic and less particularistic way than in Europe. In relation to both nature and society, harmony was preferred over contradiction. One consequence of the predominant ideas was that formal logic in the Western sense (deductive reasoning) was not as important. In the West a common misunderstanding

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[127] To try to determine a general characteristic of thought systems is to enter "dangerous ground", as Jacques Gernet phrased it in a discussion on China, based on the problems with interpreting the sources, and nevertheless he tried, Gernet 2002 1: 28.

[128] The presentation in these paragraphs are largely based on Needham 1969 and Collins 1998.

is that China (and other regions) lacks a real philosophy. In fact, the European type of philosophy is just one possible direction for thoughts among several. Nisbett presented studies about students in America with an East-Asian background compared with students with European ancestors, and could affirm that Asian-related intellectuals were more inclined to think holistically, and also to strive for consensus.[129]

If we look at possible reasons for these differences, one obvious is that intellectuals in China ruled the country for very long periods, and theories grew out of state craft. In the West intellectuals were related to the church, especially before circa 1500, and universities could be at least partially independent as a result of the fragmentated power structure. Their quest for the ultimate truth (God's truth) was, in a twisted way, constructive for science because diverse opinions were allowed to compete.

However, the differences should not be overemphasized, and not all thinking conformed to these paradigms. Logic did have a Chinese history, and holistic theories exists in Europe. These two sides of analysis are both necessary for our understanding of the world, though one of them could dominate in a region and a period.

In South Asia abstract and logical thinking was as important as in Europe, with advances in mathematics as clear evidence, and similarly to Europe, a critical tradition evolved. In both these parts of the world a religious authority wanted to establish a fixed world view through intensive debate, so rhetoric was of importance. For a long time, Islamic intellectual tradition, until centuries after 1000 AD, was the direct continuation of a Greek and Roman tradition, with an emphasis on curiosity and logic. Later mysticism and anti-scientific traditions came to the fore which is one of the most tragic events in intellectual world history.[130] This drawback

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[129] Nisbeth 2003. In a later study, Henrich 2020 affirmed these results by collecting a number of other studies. His aim was to identify a Western mentality, and a core issue is that the West was less kin-based, which is a consequence of a different family structure. As mentioned above in my text, this pattern must be seen both in historical perspective as fully developed rather late, and also compared with several other different world systems regarding the family. Henrich makes some rather far-fetched correlations, such as between density of Cistercian monasteries and modern work ethic, which undermines his whole theoretical construction. Though the text is quite long it must be seen as a simplification.

[130] Beside the books mentioned in the foregoing footnotes, Starr 2015 has given an important contribution to this dramatic change. He discussed economic and intellectual stagnation in Central Asia, and points at internal causes in the culture and mentality, though he also mentions interplay with social structure and environmental restrictions. When working with the intellectual history of Islam (as with many other aspects) *The Encyclopaedia of Islam* is an indispensable tool.

for advanced thought systems must be seen in a wider context of environmental, demographic and military disasters.

These few hints about some of the differences in the intellectual domain show that vital differences did exist. Other major differences regarding knowledge and values were related to the other spheres, such as the family structure, the socio-political world systems and the main goals for material production. But my assumption is that future comprehensive studies about these world systems will show a dynamic of their own, beyond the intellectual domain which has been discussed here.

Two hypotheses on knowledge and values

Before going from world systems to the grand history (Axial Ages), I pose two hypotheses about knowledge and value-systems. These two faculties occur and are intersected in all of the domains, and percolate the way humans think in all aspects.

+ I assume that knowledge is becoming more well-organized and structured over time. Not that earlier periods lack structured knowledge – in all times people had to grasp more than just particular, situated knowledge. The assumption is that a growing corpus of knowledge and a more complex social and material context enforces new ways of arranging what is held as known facts and acquired skills.

+ I assume that value systems will be increasingly inclusive in relation to "the other", people outside an individual's closest kith and kin. This follows from the long trend to more complex societies, where more people are engaged in contacts, both direct and indirect.

Knowledge. I follow a rather straight forward definition of knowledge: what is conditioned as a fact or a skill among large groups of people in a specific period. Contradictions over what is regarded as correct have always existed, and are preconditions for change. The long trend is to eliminate those that are less correct

or efficient.[131] (It is banal to state that more knowledge brings more questions – it is obvious that the farther you look, the more you see.)

Every individual has to organize what he or she knows and masters in an accessible way, both for him or herself and for transmission to others. In the whole society, a mass of knowledge and skills demand an overall structuring of knowledge, and normally a pattern develops so that consistent patterns exist for many fields. Because of the fluidity of the human mind, many ideas move between different domains and fields, and so coherent structuring becomes the norm. With increased amount and diversity, this societal way of structuring is transformed in fundamental ways (notwithstanding that the individual capacity remains the same). The increasingly complex production and social web also have to be handled in new ways.

I will return to these questions in more detail, but will also now highlight some partialities: accumulation, maintaining, base-knowledge and ignorance.

Accumulation. The build-up of knowledge is driven by material needs and social complexity, but for humans knowing for the sake of knowing has always been crucial. Homo Sapiens cannot live and think without asking: why and how? Both knowledge growth driven by needs and by curiosity follow *sequential processes*. Some discoveries are made before others can be made.

Maintaining and memory. Humans collect such a corpus of knowledge that preserving it becomes an urgent issue, a sort of "luxury problem" for humans compared to other animals. Means for maintaining knowledge existed very early on with a number of mnemonical techniques and by people who were specialists on different parts of the total corpus (including story teller, etc.). Later technology used to preserve the swelling mass of knowledge went through important steps, such as writing and printing.

Base pool of knowledge. The history of mind experienced an enormous expansion of the number of domains and fields of knowledge, of specialized crafts and skills. This was, however, balanced by a pre-existing "base pool" known by nearly everyone. It

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[131] Defining knowledge is a topic of its own, but here I take a shortcut and declare that reality exists and we humans have devoted much of our history to understanding it. We establish well-founded facts, and as in all other aspects of human history, nothing is constant. Today's knowledge is often tomorrow's belief, and one group's facts could be another group's object of hatred. This is not to acknowledge post-modern relativism. Facts exist, and they will kick if you turn your back on them.

is in the nature of the beast that this common knowledge pool entailed a decreased proportion of the totality. Basic skills are included such as how to light a fire (without matches) or how to read a clock. Such a base pool also included beliefs, for instance religious (that of course, by believers are considered to be facts). The common pool serves to facilitate the functionality of a society and to make it convenient. Control of the common pool generates power, but it cannot be seen merely as something directed only by the rulers. As so much else in the society, it was realized in the balance of forces between those at the top and those below.

Ignorance. It may seem strange to note that ignorance existed alongside the growth of knowledge, but human history unfolds in contradictions. Individuals and groups chose not only what to know, but also what to be ignorant about (to think what is not). A whole society can uphold ideas that, when viewed regarding the general level of knowledge in that society, must be seen as just wrong and even weird. The reason for this paradox is vested interest: overlooking the obvious can be gainful (see the discussion about crisis above).

Values. For value systems, I assume that an increased acceptance of "the other" is a long-term trend (with many backlashes). If we start with the relation to those outside the inner circle, but where physical meetings are still needed, humans developed more controlled and decent behaviour. A well-known proxy is the gradual decrease of homicide, indicating that immediate anger gradually became curbed.[132] Yet, respectful manners are much more than abstaining from violence. A stable set of rules about behaviour and politeness is deep-rooted in the mind and feels completely natural. Such rules are becoming more elaborate and people are civilizing themselves (though influenced by accepted laws and regulations).

The next step is to consider indirect contacts. Another long trend is that humans gain better knowledge about people far away, and also become more dependent on them. A growing acceptance of "the other" is a necessity. Many major steps towards closer connectivity between populations have begun with a dysfunctional reaction.

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[132] Pinker 2011 has summarized much of the research. His results regarding intra-personal violence are solid, but mixing this with war causalities is generally a mistake. Violence in wars is different, as it is related to the socio-political sphere. An expansion of martial technology makes killing effective, which is balanced by new levels of negotiations, which form another long trajectory. Measuring wars is a genre in itself, often lumping together all kind of military conflicts in a heap, which hampers interpretations. One of the best in this genre is Sorokin 1937–1941, who differentiates separate kinds and uses a source critical approach. But here much methodological work needs to be done before we can have useful numerical data.

The stronger subjugates the weaker, justifying this with ideas of superiority (slavery, colonialism, etc.). Eventually, in most cases, the outcome in the long run is an acceptance of the other, as the alternative would undermine the social and economic structure. A growing acceptance of the other is a prerequisite for a more complex society. Xenophobia truncates.

Value systems include many aspects other than how people deal with each other. One was related to work ethics, which played a considerable role in the development of production.[133] Other important parts of common mores were how children were treated, and so on. To reinforce mores, many different methods were used. An omnipotent God (seeing you when no one else does) could be a way to uphold the inner morals, but humans are social animals and the common morals, seen as a system of values, have been maintained with many other means.

[133] Jan de Vries 2008 labelled this "The Industrious Revolution" and gave it a thorough presentation, showing how it was one of the causes for the expansion of the European economy. Yet we have to recognize that a similar movement happened in China, for instance.

Axial ages

The Axial Age discussion

In the theory kit, a global rhythm is one of the pillars supporting the whole building, and the mentality sphere is a part of the building. Globally simultaneous sweeps of new knowledge and value systems went over much of Afro-Eurasia (and after 1500, over the world) several times, in line with major transformations in the other spheres. These entailed fundamental aspects, affecting all of the domains and regional systems.

There is a term for such landslide movements in how people think and feel: Axial Ages. My starting point will be the idea of several "Axial Ages", and I will redefine them somewhat to suit the theory kit.

The suggestion of one (or more) Axial Age(s) is not particularly accepted among historians, mainly because adherents have avoided grounding their theories in hard empirical data.[134] It is insufficient to use regional surveys, where experts neither move outside their own region or relate to the Axial theory (which would have forced them to consider other regions). One has to conduct world-wide, or at least

[134] In Myrdal 2016 70–72 I engage in a critical discussion of the theory. It was first put together as a whole by Karl Jaspers (1949, in English 1953), and his idea was that a decisive period (Achsenzeit) formed civilizations. He makes a number of mistakes, such as ascribing involvement solely to the elite (the "geniuses"). Later the theory was refined, notably by Eisenstadt 1986, who also included social processes. The group formed around these ideas presented them in anthologies, such as Arnason and Wittrock 2004; Arnason et al 2005; Bellah & Joas 2012. A critical voice was included, but focused on rather uninteresting objections, such as change occurring before and after The Axial Age.

Eurasian wide, surveys concerning specific elements. [135] For hardcore empirical scholars a theory that not has been tested with critically evaluated data can be ignored. Nevertheless, though being quite empirical, I find the idea fruitful and worth taking into consideration. Landslides of mentality change, similar to those in other spheres, is what the theory kit predicts.

One observation was fundamental to this whole idea. Around the mid-first millennium BCE, ways of thinking changed fundamentally across Eurasia from China to the Mediterranean. The period was labelled the "Axial age" with a dual meaning: 1/ this period was pivotal; 2/ it happened along an axis over Eurasia. Here I only take the former sense into account, and furthermore I claim that there was not just one single crucial period (a strange idea, connected to the genius-mistake), but many. Related to this, I distinguish between "The Axial Ages" which denotes the specific "identified" period (middle of the first millennium BCE), and "Axial Ages", which indicates all periods of world-wide landslides in the mentality sphere. Such major transformations occurred before The Axial Age.

The first observation of The Axial Age highlighted sages and founders of religions. This emphasis on sages is a misunderstanding of historical processes. A few have the ability to summarize the soul of the time (*Zeitgeist*), the collective and overarching mentality, but they cannot step out of their own time and their ideas to summarize how the broad masses think and perceive. From Buddha to Marx, they have been the tuning forks for the melody of the time. We have to understand large-scale changes in the Eurasian history of the mind in the context of profound transformations in all spheres, where broad masses were involved. The masses also took part in change of the mentality sphere (which I will argue by turning some of the results "up-side-down").

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[135] What kind of empirical data do we need? Text-critical analyses of essential texts, comparing specific aspects over Eurasia. Note: all of the important texts have to be included, not a selection suiting the theory. A good idea is to identify the most important texts concerning specific subjects, such as I did for agricultural treatises. This ought to be done for encyclopaedias, texts about warfare, and so on. Surviving manuscripts are less interesting than when the text was conceptualized. Surveys of all large-scale buildings could be revealing, separated between those for religious purposes, defence, and so on. Both the raising of buildings and later major rebuilds have to be included. With these and other specific proxies, one can approach an interpretation. Surveys have to comprise at least a thousand years to identify periods of faster or slower change. The Iceberg method is recommended. Comparing local dots spread over Eurasia is an alternative, but can lead to strange judgments if not used with a critical approach.

A group of scholars have gathered around the Axial-Age concept, and they suggested a series of characteristics: increased reflexivity, transcendence, and so on. As already pointed out, they did not test their ideas with source critical investigations.

Turchin and collaborators challenged some of the Axial-scholar's hypothesis, using a dataset where a number of phenomena has been recorded. The method is statistical, with an attempt to give numerical figures, but without in-depth analysis of the texts or other evidence. Even with this first and rather crude survey of data, several proposals put forward by the Axial-scholars could be refuted, for instance that the God-king disappeared during this period.[136] The group also convincingly showed that the focal point on a few "sages" has no explanatory value.

In fact, most of the ideas that the Axial scholars have thrown up in the air are questionable. A thought system reflecting over transcendence is nothing invented at a certain point of history, but rather an innate part of the human spirit. Egalitarian ideas are much older than The Axial age, and in developed forms also much younger. The list could be made longer.

We have to restart the analysis. A long catalogue of elements will not detect changes on an overarching Eurasian level. We have to look for a few fundamental and generalized aspects, affecting elements on a lower, domanial and then regional scale. Single elements that have been raised in the discussion among the Axial scholars did happen (mostly and often somewhat differently than assumed), but in specific periods and regions. We have to understand them as specific expressions of the major change, comparable to what happened in regional agricultural systems during major transformations. And it has to be emphasized that the understanding of Axial Ages, not least the first, is not possible without surveys of how they interacted with systems in the other spheres.

Let us take The Axial Age as an example, and just shortly repeat some of the major technical and social transformations that occurred and have been mentioned above. Iron came into general use, and all technology was transformed, and furthermore this entailed a deeper integration between the primary sector, farming, and the secondary sector, industry and trade. Production did take place in a much more

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[136] The Turchin group has presented a seminal article, Mullins et al 2018. The dataset is easily available on the "SESHAT" site. Turchin has produced a series of books, but they are centred on the question of empires, and how states wax and wane, for instance Turchin 2006.

complex and elaborate context. Political change was as dramatic, and the core of it was that state administration took a leap upwards, which also influenced regions outside their direct control. And empires became an option. A broad band across Eurasia was incorporated in state organized societies, and a large part of the world population came to live in more complex societies than before.

A major domain – world languages

To reiterate: we know that something happened within the world mentality systems around the middle of the first millennium BCE, but to understand this one has to consider large-scale generalized changes. To illuminate this, I start with a major domain: language.[137] Humans express much of their thoughts in words and sentences (but not everything; consider music, art, dance, etc.). The core position of language is not of the same quality as agriculture in the material sphere or socio-politics in the social sphere. Language osmoses thinking but other domains are crucial for the actual forming of a societal mentality.[138] Transformations of world languages occurred during Axial Ages, influencing the global world mentality systems. This has not been noticed much, and analysed even less, by the Axial scholars.[139]

But let us start from the beginning. A huge number of different tongues were spoken in the tribal world, and a long trend in world history is the decreasing number of languages. This cornucopia of different ways of expressing thoughts was richly fermenting soil for human development (especially in a time where more complicated discussions were not needed), but it had one disadvantage: it made contacts over vast areas problematic. Very early on a demand for simplified communication between different groups did evolve. Signs, and a few words and creole languages evolved to facilitate the exchange of objects, marriage agreements, peace negotiations, etc.

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[137] This section is largely based on Pollock 2006.

[138] Theories about the tongue steering the brain have some relevance, but all languages can be moulded to think everything. A language used by many people has a tendency to open for more complex reasoning (though the grammar could be extremely elaborate in language used by few).

[139] Wittrock 2015 211 shortly refers to Pollock, though without any discussion about the wider implications.

With the first urban societies, expanding long-distance trade made these lingua-franca tongues evolve further. For instance, in the Bronze age with large scale trading systems chained to each other, common ideas about gods and status spread widely over Eurasia – that required some kind of intricate contact. At this time the first written also text appeared. Writing was invented at least twice, in West Asia and in East Asia between 4000–2000 BCE. The first scripts were short and initially confined to specific subject areas, such as accounting (in the West) or divine matters (in the East). Gradually more domains were included, and script was further developed (for instance with the Alphabet invented in West Asia).

Then came a decisive change in the middle of the first millennium BCE during The Axial Age. World languages spread over vast areas and were utilized for a number of domains, such as literature, politics, etc. With these languages, a common societal mentality could exist over large tracts of the Mega-continent Afro-Eurasia. The process was concomitant with the first period of empires, but the causal link was not absolute. Latin and Chinese were connected to empires. In the earliest large empire, the Persian, the lingua franca in West Asia was Aramaic, but was replaced by Greek at the end of the first millennium BCE. Sanskrit was, however, not connected to an empire. All the world languages were spoken by global elites. Eurasia was chopped up between the world languages, where Sanskrit and Mandarin met in Vietnam in the East, and Latin and Greek in the Eastern Mediterranean in the West.

The global languages seized further domains. In China, written Mandarin, and in the Eastern Mediterranean, Greek, both had a period around 500–300 BCE when the first great literature took shape, which became a point of reference for eons to come. In the west a new world language, Latin, started as a local idiom and then with the Roman empire came to dominate in Europe, and remained the common language for literati for long after the empire was gone. Sanskrit in India had been a language solely for religious purposes, but in the period before and around the beginning of the Common Era, it turned into a proper world language used for literature and politics. It then spread fast all over of South and Southeast Asia during the beginning of the first millennium, and was related to an ideology about how the ruling elite (the king) should behave.

Now the elite and all literati could, across space and time, communicate about a number of core topics, forming a cosmopolitical ecumene. They did not have to meet physically (though some did), because the written text was the main media, and messages could reach far and wide. This leap in elite literati communication was

fundamental for The Axial Age. Quantity shaped a new quality, so that discussions could lift to higher levels. Furthermore, as texts were transmitted through writing, ideas could be expressed more precisely and structured, and could also be questioned in a more critical manner.

Every new subject confined to writing, coming under the spell of the world language, had a specific conceptualizing. Long stories, practical manuals, religious and philosophical treatises, political reasoning and so on. A whole intellectual universe was formed in written texts that were discussed, or could be discussed, by many literati.

Soon I will turn the causal arrow by relating to mentality changes to the broad masses, but for the moment, let us stay with the top level. The combination of a large mass of literati elite, gradually also included intellectuals in the lower strata of the society, such as slaves in the Roman empire, and an upsurge of domains becoming "literaturfähig" (proper to write about), shaped the extremely fertile environment from which the new ideas in The Axial age could grow.

A new way of thinking

Now turning from one domain, language, to the mentality, I do not aim at discussing the bouquet of precise elements on a regional level but start with of the two faculties mentioned: knowledge and structuring of knowledge. How can we analyse a new way of conceptualizing the existing and imagined entity, different ways of handling memory and new methods of structuring the massive number of facts?

To decode such profound changes, I avail myself of theories by Levi-Strauss and Walter Ong respectively, though being inspired by rather than following them in detail.[140] From Levi-Strauss, I gather his ideas on two ways of structuring knowledge, and from Ong his reasoning on mnemonical methods when literacy was being spread in a society.

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[140] Levi-Strauss 1966; Ong 1982. Their theories are surrounded by an academic debate which is not dealt with here.

Levi-Strauss framed a set of ideas around the difference between thought systems in a pre-literate society with a limited social complexity compared to a more complex society. He labelled the former "the savage mind", and underlined that it was not only about practicalities but was also a quest to understand the world. He thus also considered "pre-scientific" ways of thinking as an equally proper label. Knowledge was structured in relation to the surrounding world as a totality. This thinking was obsessed with cataloguing items with a keen interest in plants often of no practical purpose, just a demand for order. Systems (in totemism) were often built with associative combinations of animals and plants, and this was assumed to reflect some inner meaning of the reality.

The whole theory was ahistorical (which Levi-Strauss emphasized), and is mainly based on anthropological investigations, but I see it as a portrayal of how people thought about the world in earlier periods. Thus, it can be posed against a gradual change that transformed the thought system. This also implies that what we still use our savage mind, residually. In this long-term process of change, The Axial Age was probably a crucial period for a switch from an earlier system to a more well-structured one, using the meaning of *structured* that we use today.

The more modern way of structuring has particular characteristics. The entity is perceived more as divided into specific sectors and much effort is invested into identifying and combining these. Generally, abstract principles are applied but at the same time, more details are enumerated (as a consequence of evolving methods of preserving knowledge). Metaphors are still important (they are how we think), but now metaphors are not perceived as explanatory. Instead, other causes and effects are recognized. There is no general tendency to move from holistic to analytic ways of reasoning (or the reverse). To see the whole or the particular are two opposites, driving each other forward. In a specific period, one or the other can dominate, but they always coexist and evolve in a mutual dialectic.

Structuralizing and writing. What we consider as a well-structured thought system is related to writing. The text is linear and accordingly there is a tendency to replace the patchwork of information in an oral communication with compartmentalized information that is also presented according to a layout. Sections are devoted to specific subjects. Instead of jumping from one subject to another, as in oral communication, chapters are laid out in a row. The writer and the reader can go back and forth in a text, which also means that repeating becomes less necessary.

The totality is structured in a linear way, sections are separated and descriptions for each are given with an encompassing aim, and the sections are related to each other by summaries or references in the text. This model is certainly not there immediately, but evolves gradually (much as prototypes and perfect types in technology).

The information becomes fixed, and can be much more extensive. When arguments and data are more stable and detailed, they will be scrutinized by others. A different type of debate can evolve, compared with earlier periods (where discussions, of course, were also intensive). Now it can be more meticulous and thoughtful, at least among the intellectual specialists. A whole new intellectual universe opens up for discussions.

We can turn this upside down. New technology and increased social complexity demanded a more structured way of thinking. When what the larger world and individuals had to conceptualize included cities, state administration, craftsmen, markets and other segments of a complex society, this influenced a person's thinking. It had to be both more sorted and more split up into sections. Remember that the ability to handle information has not increased, and the size of the common pool of knowledge was much the same, though the content was transformed.

All, both the rulers and the ruled, needed access to a larger corpus of information, covering more parts of a society, and this can only be achieved if it is sorted into categories, where every individual only means and entries. For instance, a farmer cannot grasp the whole market for grain, but needs access to this entity. Specialists are needed, and the common pool must entail ways to reach these specialists. These included both craftsmen and intellectual specialists.[141]

The new of structuring of knowledge started to transform the mentality in the society around the middle of first millennium BCE, a process interrelated by writing conquering more domains and being invited to these domains. The wave of new religions and philosophical systems was an expression of this new direction of thoughts. The elite and broader strata of the population were included in a common flow, so that the emerging ecumene among the literati can be seen as one outflow of this shift.

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[141] For instance, the medieval guilds were constructed to upkeep quality among experts and today's universities are one of the most vital remnants of this system because quality is such a core issue in knowledge production.

Ong researched how myths and legends were formed to be transmitted orally compared with how they were designed as literature. In an oral society, stories were built with the help of set phrases and other repetitions comprising whole building blocks of words. Proverbs and sayings were important. Long stories varied in details, and were adjusted in relation to the audience, which did not transform the overall content. In this way a memorial core could be preserved for very long time periods.

With the written text this whole set of methods became obsolete, especially when a number of new domains were conquered by writing in The Axial Age. Stories were still told, but now a written version existed which influenced the oral version. The codex tended to be regarded as the correct version (or rather a set of closely related correct versions). Besides literature and religious texts, encyclopaedic collections of data, such as agricultural treatises, also emerged in Rome and China. The written text establish itself in pool position, as the standard.

These new ways of remembering and maintaining a large mass of knowledge were linked to a different structuring of facts.

What Ong did not discuss is how mnemonic, the art of remembering, evolved stepwise. At first books and other longer texts were rare, and most of the literati only seldom had them at hand. Thus, an intermediate step between the introduction of the written text and when books became everyday objects had to develop. When the written texts included more subject areas and took a more central position, goals for how to remember changed. The inexact, variable narrative was replaced by a quest for exact wordings, because now an archetype existed, namely, the written text. For a long time, manuscripts were few and hard to come by, which was the prerequisite for the new form of mnemotechnic took shape.[142]

In Europe a specific art of memory was developed during this intermediate period, and it has its own research tradition.[143] An essential part of the method was to connect what should be learnt by heart with striking images and then place them in a fictional house or along an imagined road. The method dawned in Antiquity, and became foremost among literati during the Middle Ages. In China learning

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[142] Accounts are partly a different question, because these were shorter and could be kept by those who needed them. Written text was supplemented by a number of marks on other materials, such as wooden sticks. Preservation of written accounts has an interesting geographical variance, where Europeans keep records to a higher extent than for instance China, see Britnell 1997.
[143] See Yates 1966, Carruthers 1990.

by heart was of paramount importance, not the least because of examinations, but nothing like the European mnemotechnical method emerged.[144] The point is that verbatim retention was a new way of conceptualizing which took a leap forward in The Axial Age, but different solutions for achieving the new goal existed.

Much later, when the printing of books practically exploded in Europe, from the 16th century, the elaborate methods for memorizing became obsolete. Now books were accessible to all, not only to the elite, and thus a quotation could easily be checked. Learning by heart was still a core method in education, but now with simpler methods.

The context. Precisely as the new structuring of knowledge can be seen as a two-way process between knowledge technology and societal demands, the new possibilities in preserving all facts were related to transformations in the other spheres.

With more diversified material production and division of labour, there followed an exchange of goods in a number of situations, such as trade, tax paying, etc. All this required more accounting and contracts, but also elaborated laws. In the social sphere, increased complexity required refined reciprocity in a number of social contacts (the market, the state, etc.). A web of social contacts went far beyond the local community. In such contacts careful recording was important. This quest for exactness could be utilized with the written text.

Precise and well-defined agreements and regulations offered a foundation for meticulously formulated arguments. Such texts could also be consulted and interpreted, which was linked to societal demands in a complex society.

An important process was related to ownership. When more labour was invested into land, property rights needed to be more well-defined, and the written document offered means to both be more precise, and establish precise and long-term ownership. Such registers were of immense importance for land owning societies.

Thought systems being structured and preserved in new ways were major elements in the leap during The Axial Age. Written texts and world languages were other interrelated elements in this transformation. These processes evolved in an interloop with landslide changes of the material culture and social structures.

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[144] Spence 1984 tells the exiting story of a failed attempt to transmit the European method to China in the late sixteenth century; the irony of history was that this method had lost its position in Europe at the time.

Value-systems

The other main part of Eurasian transformations in the mentality sphere was related to value systems. As mentioned, over time humans tend to be more considerate in their direct and indirect contacts, and The Axial Ages are crucial periods in this long trajectory. For instance, actual coinage was introduced in India, China and around the eastern Mediterranean at about the same time (the seventh century BCE). Accepting coins is a prerequisite for extensive trade as well as an extensive state apparatus.

On a generalized level, I would like to draw attention to a moral principle which is labelled "The Golden Rule", a maxim which says that "one should not do to others what one would not like them to do to oneself". If posed in a positive form it becomes more commanding (you should help others). Such ideas have been with humans forever in the family and small community, but the historical tendency is to include larger fractions of humanity. The whole concept has a Western touch, but Karen Armstrong has tried to apply it to the whole world. Armstrong has read many of the important texts, and she is not a member of the Axial tribe. I shall shortly refer to her conclusions regarding The Axial Age.[145]

The Judean tradition expressed the Golden Rule strictly, but mainly confined it to their own group, however, with Christianity most people in the world were included. Armstrong stresses that Jesus was only one in a row of prophets proclaiming this rule. For Greece, she points at theatre as a way of feeling empathy. Indian philosophy travelled inwards through meditation, where a person's "karma" was related to correct behaviour. China had, from the beginning, a focus on societal organization, and ritual was an instrument to steer morals.

This short paragraph does neither do justice to Armstrong nor to this multifarious alteration in diverse parts of Eurasia, but taken altogether, we see that these changes, rather than just adhering to a single "Golden rule", show a tendency to understand and relate to the needs and wishes of others, and an urge to abstain from aggressive behaviour. Eurasia experienced a surge of long-distance contacts, with growing trade and larger political entities. As already mentioned, these trajectories demanded more sophisticated behaviour in relation to foreigners. To come further, I believe Armstrong's method, a close reading and comparing of texts, is the only feasible one, but it has to be developed with a stricter framing of evidence and a wider set of hypotheses.

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[145] She has written a series of books regarding these issues. The most important in this context is Armstrong 2006.

Though major world systems were formed, there were of course contacts between them and we have to assume that discussion about pros and cons with their belief systems was constantly ongoing. In the Alexander legend there is a long section where the hero discusses with Indian sages, and though of course mythical, this represents something that really happened. It was not just societal and economic circumstances that shaped a common overarching tendency, but also a dynamic on the meeting of the intellectual traditions as such. More data about this is much needed.

The discussion so far relies on sources from high culture, texts read by few. Admittedly this is in line with my argument about a common ecumene for the elite, but we also have texts that allow us to detect what was going in the minds of the masses, namely collections of proverbs and fables. (Shorter epigrammatic texts, on gravestones, etc. are also of interest, but most often do not reveal the more complex ideas.) Proverbs and fables should be handled with keen source criticism, but they were spread widely. They show a less rosy picture, as a main theme which emerges during The Axial Age is how the mighty oppress the weak.[146] Resistance does not yet surface in the fables, but in the medieval European proverbs we meet those about oppression and those that talk about resistance. Without taking the results in my restricted study too far, it is possible that The Axial Age had an element of how the masses conceptualized their new role as subjugated inhabitants in strong states.

To this comes an extremely important issue, namely how the relation between ruled and rulers was conceptualized in a society, and my hypothesis is that the theories on statecraft was far more advanced in the East than in the West, but to this I shall return in the coming report in the agricultural systems in eastern and south-eastern Asia.[147]

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[146] Paremiology is the study of proverbs, often with an aim of identifying proper proverbs. I have not used such purged collections, as the goal was to use collections as testimonies of their time. In a pilot study, the following sources were used: Sumerian proverbs, Aesop's fables (from Antiquity) and medieval proverbs in various collections, compared with texts such as the Indian Pañcatantra with many fables. I took special interest in social conflicts. In the earliest Sumerian, not much of this turned up, but Aesop (or rather all those fables ascribed to him in Antiquity) had subjugation as a lead theme. Medieval proverbs have been a core interest of mine for a long time.

[147] Interestingly *The Book of Odes*, is a Chinese collection of mainly folk songs that got its present form around 600 BCE, has a number of poems about the oppression of the common people, but with a different tone than the fables: here it is more of complaints rather than advice about how to escape and avoid.

Following Axial Ages

A new crucial period came in the centuries around 1000 CE. I again start with a main domain, the languages. A sequel to the change in The Axial Age followed. Regional languages now replaced world languages in much of the written communication in Europe (from Latin) and in South and Southeast Asia (from Sanskrit). When vernaculars became dominant, much larger strata could take part in the more advanced communication of ideas. The growing number of literati was concomitant with a swelling number of domains served by written texts.

I take Europe as an example. Christianity as a conscious faith spread to the broad masses when the religious organization reached down to the community with village priests and churches in the centuries around 1000. At the same time, specialists in the towns and the countryside increasingly used accounting, and the nobility started to take an interest in texts (religious, chronicles, novels). We should not underestimate the role of women, especially in the upper classes. Universities, cathedral schools, together with home education gradually increased the number of literate persons, and most of these only had a faint knowledge of Latin. The vernaculars gradually advanced in the High Middle Ages, and then took control over much of the written communication in the Later Middle Ages.

The intellectual elite continued to be in contact across country borders using the world language Latin for a long time. Not until the next Axial Age, the eighteenth century, were the scholarly domains also lost for Latin.

A similar widening of the strata using written text seems to have occurred in India, where the advance of the vernaculars went along with a regional order with smaller political entities. At the same time Brahman literati settled in most communities.

In China the world language was not phonetic and comprised several tongues, so there was no room for the rise of written local tongues. However, we find a similar tendency of a mounting public for written texts in these parts of Eurasia because of the early introduction of printing. It got its first breakthrough around 1000 in China, and this was far ahead of the other regions. Europe came next with a breakthrough for printing in the decades around 1500, and then with a fast expansion of the number of printed titles, with the effect that books were made available to a wider audience, to the middle class.

Identifying Eurasian wide proxies for the structuring of knowledge is a rather neglected field, but I have done a survey of all agricultural treatises in the world before 1500 (and followed up with a survey of the European ones until 1800). A first leap came during The Axial Age, and this kind of literature developed independently at about the same time in the Mediterranean and in China (around 500 – 200 BCE). They were then produced at a constant pace, until around 800–1000 when a new upsurge came in China, in the Islamic world, and eventually also in Europe in the High Middle Ages.[148] This study can be seen as a proxy for many other genres, with a similar periodization.

It seems as though the general tendency during these centuries was a spread of elite ideas and then also a transformation of them. The centuries around 1000 can in many respects be seen as the fulfilment of what happened in The Axial Age. Changes of how knowledge was structured now penetrated the whole culture.

Regarding value-systems, I will be very brief, and just mention that in Europe slavery was gradually abolished and the peasants were recognized as one of the pillars of the social system in the centuries around 1000. All of Europe experienced intensified land utilization and production in other sections facilitated by the raised status of the lower classes.

Further decisive steps in the overall change of mentality followed. In Europe the 16th century entailed dramatic intellectual changes, especially in relation to the state. The reformation and counter-reformation erased or seriously weakened the catholic church as a parallel structure, and at the same time paved the way for individualization (in the first hand, between a person and God). We have similarities with Chinese neo-Confucianism, but I will not follow this path further.

The Enlightenment is certainly an Axial Age when acceptance of novelties blew like a wind together with increased freedom and acceptance of all citizens in a nation as equal. And the corollary of that is to regard all humans as equal. To describe these combined new ways of organizing knowledge and new value-systems would lead me far astray. I will only point at the interloop between the

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[148] Note that one cannot measure the general level of agriculture with this measure, which only relates to agriculture being Literaturfähig, which is was not to the same extent in South Asia as in the other intellectual centres of the world. I discuss this in Myrdal 2020b, especially in relation to the relative lack of longer agricultural treatises in South Asia.

transformation of the mentality sphere and simultaneous changes in the other spheres.[149]

If the pace of technology change went faster, with a growing population and refined specializations, then at a certain point, novelties would become the norm. New methods always implied a risk, but if productivity increased, the available surplus would diminish the risk. From this perspective, the economic Enlightenment can be seen as a natural response to major tendencies in technological and economic change.[150]

Without repeating what I said earlier in the section about reconstruction after a crisis, I want to bring up the pendulum sway between folk and elite culture being closer to or more isolated from each other. The seventeenth and eighteenth centuries in Europe is a typical sequence, where a pronounced elite ecumene caused a fast advance in science, which in the next phase married with the new mentality and desire for novelties during the Enlightenment.

There is no doubt that Eurasia, and later the whole world, has experienced major and rather simultaneous transformations of the mentality systems (here labelled Axial Ages). These have always responded to and interacted with transformations in the other spheres occurring at about the same periods. The history of the mind cannot, however, not be seen just as an epiphenomenon to social and technological change. It has had a dynamic of its own where the lower classes also take part.

We are now approaching a summary of the whole theory kit, and one essential part of this will be that the grand rhythm during the longue durée can only be fully grasped when all spheres are taken into account.

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[149] Often the Enlightenment is seen as a European phenomenon, which is a mistake. The whole world became involved, not the least because of the total economic and social interaction in the world. Europe influenced and was influenced. Take abolition of slavery – a hinge for the new value system – where European intellectuals and the slaves revolting, in for instance Jamaica, strived in the same direction.

[150] In an article about all books and articles about agriculture in Scandinavia, I could show how discussion in written texts about diverse topics was in accordance what happened on the ground: harrows were discussed when harrows changed, and because of the limited spread of this literature, the intellectual influence must have gone from the farmers to the intellectuals. Here I also include a study of all books on agriculture in the anglophone area, see Myrdal, forthcoming.

A totality

The very long history

I have only covered a part of the long human history, one longue durée from before and around the middle of the first millennium BCE until the industrial breakthrough. Human history is so much longer, and with the terminology used here we can talk about several long eons (longue durée). Another longue durée was the introduction and spread of agriculture and the dawning states and urban communities. And before that, hunting and gathering had its own longue durée with major technological advances, such as the forceful throwing spear (atlatl), and the bow with its precision. Gathering also went through profound technical change, with a tendency to take care of plants, eventually leading to pre-phases of agriculture. And these fundamental technological breakthroughs interacted with transformation in the social sphere and in the history of the mind.[151] To summarize the text laid forward here is not to give "the totality", but "a totality".

I also assume that we may be at the end of such a long eon. Beginning in the nineteenth century, the crescendo of material production seems to reach its limit, and a renegotiation of the whole set of world systems and goals for human society seems to lay ahead. The period from around 1800 and the following two hundred years is then regarded as a longue durée in itself. It could continue for quite some time, or we could be facing a transformation. If the latter is the case, the last two hundred years will probably be seen as the transitional period, rather than an apex.[152]

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[151] In another work I have lined up ten major steps in the history of technology, and less than half have been treated in this text, see Myrdal 2002.

[152] Shall we guess that the current period in the future will be labelled "the time of waste", rather than "the time of affluence"?

At the outset I claimed the human mind is capable of forming mental images of things not actually present, and by art and craft these imaginings are turned into results. But this was only the inception to a much more complex reasoning, where I tried to build a huge structure. It is now time to put the pieces together.

Music of the spheres

My credo has been that all the spheres are of equal importance, working in harmony and in tension with each other. A multitude organized into unified description has been the goal for this text. Metaphors that catch a wider acceptance are formatting our thoughts. Popular allegories of human society have been of the house and the body: the former emphasizes the ground floor (material production) and the latter the head (leaders and intelligences). The house simile is often used in a Marxist frame, and the society as a body is an old metaphor. Both have their points. The fundamental material production exists, and the ideas steer our actions.[153]

I wish I could have found a striking allegory where all of the diverse parts contribute. The best I have found is a small musical ensemble, a jazz or pop band with three or four members: guitarists, drummer, or if a small jazz-band, also a pianist, a saxophonist – no lead singer, no lead guitarist, a band playing instrumental music. Together they all contribute:

"This eon-ing the Historical band is playing The Music of the Spheres".[154]

I admit that this simile for the whole of human society and its history is not perfect, and do not want the following only to be seen as a description of a small and tight band's gig.

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[153] There are many other allegorical descriptions of a society. I dislike the medieval beehive-metaphor, not because it mistakes the queen for a king, but because it is so extremely elitist. A better simile was used by Marx himself when he said that a society is like an orchestra with a conductor – leadership is a necessity, which of course was correct, but ought to have been elaborated upon to see the interaction between the conductor and all the musicians. The quote is from the first volume of *Das Kapital*, and leadership in society is also discussed in volume three, see Myrdal 2006a 146.

[154] I know that this is an astronomical term, but abandoned by today's astronomy and thus free to use.

I have said quite much of the sphere's tripartite functionality: the material sphere provides the resources to sustain the whole society; every undertaking in human history is collective, and the social sphere sets up the frames for all activities; and last but not least, the mentality sphere not only gives legitimacy, but also offers ways of thinking about all three spheres and about the human self. Human ingenuity invents new wants and solutions in an endless row, where the history of the needs, in some respects, can be seen as a fourth sphere.

Having said this, I also want to register the differences, shaping a dynamic in the interaction. The more gradual change of technology meets a social sphere where long periods of stability could switch into periods of fast, revolutionary change, so the material sphere sometimes seems to be ahead of and driving social change. In other periods, changes in the social sphere are more fundamental. Basically, the material sphere is the main force in periods of expansion, and the social sphere is in phases of reconstruction. So, they switch playing the lead, which is important for the rhythm of history. The history of the mind is more fluid and varied, and not only elaborates on the other two but also influences and is influenced by the big leaps in the other spheres during major transformations.

Regional systems — World systems

I have claimed that regional systems built the world systems, and the latter formed the former. Let us look a little bit deeper into this, but first a short reminder: the regional systems consisted of many interrelated elements, and the world systems of a few generalized elements (for the mentality sphere the same difference exists among domains and world systems). To understand this relationship a stepwise reasoning can be helpful:

1) The generalized, overarching elements are mirrored in some of the more particular elements on the lower level. 2) The whole set of generalized elements in a world system exists in all the regional sub-systems. 3) These generalized elements bend all the elements in the sub-systems that they correspond to. 4) Many of the elements in regional systems do not correspond to the elements also found in their world system, but are nevertheless affected in the complex. 5) A world system exists and expands by including regional systems, and the set of elements that makes the system is thus dependent on their existence in the sub-systems. 6) Transformations

of regional systems reorganize elements, but the correspondence is kept, though often with changes, to the overall set of generalized elements.

Generalized elements, such as wet-rice cultivation, thus find correspondence to particular elements in the technological complex on a regional level. This could be the size of dams or the existence of transplanting. In different regional systems, the generalized principle expresses itself in different ways (transplanting or not transplanting). On a generalized level, the whole set of elements spreads to large regions (wet rice over much of East Asia), but with diverse corresponding elements on the regional level. The spread of the overall dominant set depends on how the regional systems are built (which on the other hand, is related to their inclusion in a world system).

The interactions between the spatial levels have their counterparts in all the other systems, such as feudal Europe and all the regional expressions of this overarching system. In the history of the mind, we instead have a relation between world systems and the domains that make up a grid of related elements (with their relations to other domains and to regional systems).

To repeat: Many regional systems exist as sub-systems to a world system, and the general elements in the world system affect all these regional systems. Every general element will thus influence several specialized elements on a lower spatial level. These relations between the world systems also shape indirect relations between all the spheres, and their specialized elements. This is a complicated web of relations, and we have to remember The Rule: there normally are a few alternatives. The links and tendencies are not absolute, which is also why we have several world systems.

One thing more. The world systems have so few elements that they cannot be understood without taking other types of systems into account – and this also steers their relation to sub-systems. To return to wet-rice: the spread of wet-rice as a dominant overarching element is related to food habits, to rice being a taxable product (it can be stored, and it is often seen as a food for the rich), and so on.

In Appendix F the relation between the whole and its parts is considered in a more abstract way and in relation to the dialectical thinking that flows as an undercurrent throughout this whole text. In the appendix I try to explain, very briefly, why every element in human history undergoes constant change.

Pace of change and global rhythm

I differentiate between "world" systems and "global" rhythm because the systems existed over the whole world, but the rhythm only affected most of Afro-Eurasia during the longue durée up to 1500, and only thereafter increasingly affected the whole world. America had a rhythm of its own before 1500, and in the world before 1000–500 BCE the common movements were more regionalized, such as West Asia, including large tracts of Europe and Northern Africa, as one common ecumene in the Bronze Age.

Let us start with the cyclical movements. Phases of expansion, in relation to the dominant goals for social change, transform all spheres. However, stagnation follows expansion when the latter is running out of steam. The tendency to over-exploitation is related to stagnation, so it worsens it, and when combined with dysfunctional reactions it turns into a crisis, which always is related to the reactions from the social structure. Such a crisis could then open to reconstruction, when the social structure is renegotiated, and during such periods elite and folk culture tends to interact more closely.

The cyclical movement changes over time. The rate of technological change causes a reduced wavelength. With increased general affluence, crises are becoming less catastrophic but the general pattern prevails.

From regional transformations, following a cyclical pattern, we can turn to the larger geographical regions and the lingering question is: why did the world systems tend to change at the same time, and not only in one sphere at a time? My answer to the enigma will follow two paths: firstly, one about the pace of change, and more importantly about interference.

The scale is of paramount importance for the pace of change, and in Eurasia large regions had about the same amount of people. In these regions – Europe, China, South Asia and to some extent also West Asia – we can assume that transformations in all spheres did evolve alongside each other, building up expansion and turning into stagnation going over to crisis at roughly the same periods. This would explain some of the synchronized change, but not to the extent that we can observe.

Instead, we have to look at another phenomenon – the interference. Flows of influences went on in all aspects of life over the Mega-continent, and this complex stream appeared in all the spheres concomitant and interrelated. Elements of technology

spread, socio-political structures influenced each other, ideas were disseminated. Influences also went on between systems. Together this shaped a common rhythm: everything changed at the same at the same time because everything changed together.

We have to imagine billions of changes wobbling together, on different levels, of different importance, but nevertheless forming a human totality oscillating at roughly the same pace. (This is also why I strongly reject any simplified one-two-three-factor theory.) Indeed, not all of the Mega-continent became involved; some regions were left aside, stagnant or even in some cases, had a faster rate of change than the average.

Let us take the enormous leap in the middle of the first millennium BCE. In the material sphere a new metal was related to a multifarious transformation of technology in several sectors. In the social sphere change came as an avalanche, with an explosion of state building and trade. The history of the mind shows it went through profound changes, The Axial age, when a new structuring of knowledge was combined with a growing acceptance of the other. All these interacted and moved together causing a huge interference. In waves back and forth over the Mega-continent, between the systems and the sphere a total transformation took place.

In the periodization used here a new longue durée commenced. Changes in all spheres were combined with the evolution of new sets of world systems (some of them were transformed, others started to evolve). A new totality meant new possibilities. In path-dependence during the longue durée, these world systems evolved along parallel trajectories in all of the spheres; they diverged and converged in a valley of possibilities.

Such enormous landslides in all these spheres then followed, were built up and pushed change right through all of the small sub-systems. The leaps and bounds followed about the same pace, as the entities affected were of about the same size. This interference of thousands of systems is the main explanation of the global rhythm.

Appendix A: World trade systems

Trade and contacts are often taken as the essence of world history, uniting humanity into a whole. Influence streams this as the point of departure for a world history is an appropriate approach, as I have an agrarian history. Another thing is to claim that this factor is the most important. So let us take a closer look. Firstly, one has to separate between influence and trade; they are not exactly similar phenomenon. I have discussed diffusion previously, so here trade will be in focus. Trade is dependent on basic production, agrarian and industrial, and is also controlled by the social and political structures. It is not a prime driver in history, not even today.

A large group of world historians adhere to the "world-system-theory". This is founded on two premises: during a particular period the world was united into one system, and this favoured the core in an unequal exchange. Paramount importance is put into this notion. I am a disbeliever, but the question is whether there is some relevance for these sets of theories.

The Marxian hypothesis about primitive (original) accumulation is often the basis for these theories, and then usually concentrated on the part of that hypothesis that pointed at the importance of exploiting colonies to promote capitalism in Europe. Later the concept was widened, and an intensive debate followed as to when the world was united into one system. One fraction held this system to be very old, at least dating to the Bronze Age, and thus luxury trade had to be emphasized (as bulk trade is obviously a much later phenomenon). The original version of the world-system-theory, by Wallerstein, pointed at the Early Modern period, the sixteenth and seventh centuries as the crucial period, and consequently laid more weight on bulk trade. If we instead listen to most economic historians' claim, then it was not until the steam engine (ships and

railway) in the nineteenth century that the world became ultimately united into one efficient market, where a genuine geographical division of production developed.[155]

I have already questioned the idea of exploitation as a means of driving history forward, and cast doubt over the idea of the empire as an efficient way of controlling people (because of the cost of supervision, as subjugated people tend to resist oppression). Yet, I do not want to play down the importance of trade, and a short sketch over the world history of trade could be helpful.

Chains of bartering existed very early, and over time cultural influence moved globally. Useful raw materials such as flint and obsidian were mined and traded over long distances in the Stone Age. An important step came with the first small states and urban communities, as surplus production could be assembled to form a basis for luxury trade. During the Bronze Age the base metal was an alloy of tin and copper and these metals were rare, and had to be combined by long distance trade. All of Europe and West Asia were then integrated into one trade and influence area, with direct contacts over large distances. In eastern Eurasia similarly large and interconnected regions emerged.[156]

Iron can be found practically everywhere, and at the same time the new metal transformed technology and society. Long-distance trade decreased in importance, but just for a period, and then it grew again, and then on a higher level of importance and magnitude. Empires and a larger, richer upper class gave the foundation for the overland Silk Road (where many other products than silk were transported). Bulk trade was augmented, with an increased role for iron (and other base products), and to support the core of the empires.

In the Middle Ages Eurasian trade-networks multiplied, especially from the seventh to eight centuries onwards (with the Tang empire and the Muslim expansion). Augmentation of trade then went on throughout the Middle Ages so a dense network

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[155] Wallerstein 1974 is a starting point for this scholarly movement, which has since been quite diversified. He was firmly based in the literature, but some later attempts painted with broader strokes, such as Frank 1998, who belongs to those who believe in a very early and important role for a total world system. (I am not particularly impressed by how Frank handles the sources: secondary literature). Many others could be mentioned, and a central work a little bit to the side of this school is McNeil & McNeil 2003, which gives an insightful world history with the global network as a sorting principle.

[156] Kristiansen 1998, Kristiansen et al 2018.

over land and the oceans shaped a trade flow which was unstoppable by any political changes.[157] The Indian Ocean gradually took over from the inland route.

Expansion of long-distance trade was connected to an increased consumption of luxury, such as spices, at the end of the Middle Ages and during the Early Modern period. Bulk trade in the major regions expanded, and transport technology took a leap, especially in shipping. The sea empires, based in Europe, took a lead, and this can be seen as a direct inclusion of Europe into the Eurasian trading system.

A further leap came in the nineteenth century, related to industrialization, with a geographical division of labour, when basic food products such as wheat and rice became a crucial part of worldwide trade and additionally included a number of other voluminous products, such as timber, coal, and so on. Transport technology had now decreased the freight costs so much that nearly all products could be sent around the globe.

Indeed, one can discuss a one-world-system from the Stone Age, but the interesting feature of such a system is rather the large-scale changes in relation to other systems. The only certain long-term trend is the increase in scale, and there is no tendency towards the core becoming more and more essential. According to the theory kit, there ought to be several world systems, and such subdivisions into several world systems have been suggested.

An influential attempt was made by Abu-Lughod, in a book where she argued that Islamic trade was of fundamental importance, and that Europeans merely took over an already well-established trade-network. She presented a number of circles covering the Indian Ocean and the surrounding land areas. According to her, world cities constituted the centre for these circles, and religions and political factors were decisive in how she draws them. A very bold and ambitious attempt was made by Beaujard. He included all of Eurasia from the Bronze age. In fourteen maps, he described trade in the Old World from c 3000 BCE to 1500 CE. A main idea is that several systems emerged in the second millennium BCE, and a unified world system was established from around the beginning of the Common Era, but

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[157] Lindkvist & Myrdal 2018, with a map of all the main trade routes in the fifteenth century: a dense network over all of Afro-Eurasia. All routes were not utilized all the time, but they formed a net so trade could flow constantly. The map is based on regional maps and gives a better picture than usual trade-maps in historical atlases where only a few lines are drawn. Here we also mention literature of importance for a discussion of goods traded.

still with several subsystems marked with circles.[158] It is not obvious what criteria Beaujard used to delimit these subsystems, but as the maps show "core" and "semi-periphery", it seems that these are mainly defined by socio-political factors (as Abu-Lughod's circles are).

These maps have been widely spread and cited in the literature, and it is certainly a step in the right direction to present maps rather than to just give vague descriptions. Maps covering trade routes, and also products, belong to the second most common in historical atlases, after the completely dominating political maps. Abu-Lughod and Beaujard are among the few who have dared to represent world systems, but these are mainly depicting political systems, and circles are not really how world systems appear. I think it is problematic that these circles have been drawn in a rather sketchy way, and even more that they are not directly related to trade.

My suggestion (in line with how I regard other world systems) is to concentrate on the trade as such, and identify some common elements. Bulk and luxury trade should not be put against each other; instead, they are both fundamental to understanding how transports evolved, but a world system analysis should start with bulk trade, and regard long distance luxury trade (precious goods that could bear the transport costs) as the link between the regional systems.

Then northern Europe would be one system of bulk trade from around 1000 CE, but the Mediterranean was already such a system in Antiquity, and these two would be united in the Late Middle Ages. China, organized around the two river valleys, was a united trading region from the time of the Han-dynasty. Such an analysis could start with the rather rich secondary literature, not least all of the historical atlases. As a second step, primary sources can be consulted, but merely for pilot studies as we here (as in all other world history topics) encounter a vast amount of literature.

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[158] Abu-Lughod 1989:32–33 about the factors. Beaujard 2019 presents an affluence of data, and his book can be used to track the main goods traded in long distance luxury trade. For a critique, though short, of the limiting of these systems, see Norel 2009 108–112. I have not seen anyone who really tried to test these circles with hard data. Some critics have suggested more circles, for the region they know best, which is to accept the circles without pondering methodology.

Appendix B: Europe and geography

Some historians are obsessed with the question: why Europe? The West dominates the modern capitalist world, and how did this come about? As the reader may have guessed, I do not think that this is one of the most urgent and interesting questions in world history. It is justified to ask why a certain region seemed to be ahead of other regions, but one must differentiate between the most advanced and the dominant. To give a rough sequence: Africa was the foremost for eons, and then West Asia was ahead of other regions for millennia, followed by East Asia as the most advanced major region from the Middle Ages. Europe took over the leader's jersey for a while, including North America during the last century. In the future maybe the whole world will be so integrated that a specific, most advanced region cannot be identified.

A dominant region can only evolve in an integrated system. Empires are the typical form for such dominance. European states, or alliances of states, dominated the world for a period, so the question remains: why did European states come to dominate the world? Starting with historical causes, a long series of such have been suggested. Just to mention some of the most salient: the diverse political structure in Europe; the family strategies with late marriages; a strong legal system. I would like to point at some propensities that have been underestimated.

+ Mixed farming was a more extensive system than in other populous parts of Eurasia (so the total population in Europe could have been higher). This system instigated an increase of labour productivity, and was also open to flexibility: in periods of falling population, livestock breeding increased on behalf of field cultivation (and vice versa). The innate tendency to extensive agriculture prompted a larger proportional role for the secondary sector, which was a factor that facilitated industrialization. Mixed farming was also related to the family structure and the rather prominent role of women, at least from the Late Middle Ages onwards.

+ In Europe, especially from the Late Middle Ages, the broad masses gradually captured influence over socio-political systems, which was eased by the structure of rather small polities balancing each other, and the feudal system of transferred power. Balance of power was to some extent turned in favour of the populace, which had consequences: it influenced the role of women; it shaped a market for luxury items being turned into everyday objects (manufacturing just to produce extreme luxury for the top strata can never lead industrialization).

Now turning to the environment, I want to state that this is not launching any "environmental determinism", quite the opposite. To identify what is not culturally predisposed is to give human history its correct and decisive role.

Obviously, mountains and deserts designed the routes along the Silk Road, up the Kansu corridor, passing Taklamakan and then down along the valleys in Central Asia. Trade routes also followed the big rivers and the monsoon gave a seasonal pulse to trade over Indian Ocean and in the South Chinese Sea. There were bottlenecks to be passed, both at land and sea, and these became hotspots of trade, such as the Straits of Malacca.

When Europeans started to dominate, a gradual shift from trade over land to the oceans had been on the way.[159] We have to look at possible European advantages in seafaring. When land transports dominated, West Asia became the hub of long-distance trade, and when ships sailed across the Indian Ocean, this part of the world was even more established as the crossroad. Europe was at the outer end.

With seaborne trade over the oceans, another propensity was of crucial importance: the coastline in relation to the landmass. A glance at the world map shows that second to Southeast Asia comes Europe as the major region with most coast in relation to land. This fact is well known and has been pointed out by several scholars.[160] As most scholars overlook this factor, it is worth a closer look.

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[159] Lindkvist & Myrdal 2018 519–526, cf. Grataloup 2007: 19, 33. Bosworth 1995 219 presented an interesting diagram which shows that the largest cities became more maritime, that is with oceanic ports instead of inland, from the Late Middle Age.

[160] Jones 1981 (2003) 226–227, 1988 173 mentions it in passing as one reason why Europe had an edge over other parts of the world, and Buzan & Little 2000 65 refers to Jones. Acemoglu and Robinson 2005 calculated coastline versus inland area per country, excluding the Baltic and the Mediterranean as they wanted to measure easy access to the Atlantic.

A long coast directs human activity to the sea, but always in relation to the scale of trade and correlated with technological factors. On a regional scale, fishing is of importance and shorter transports go by boat in a coast dominated area. On a national scale, a long coast also steers defence, long distance trade, connection between cities and direct resources to this sector.

Let me take an example. China was the mightiest power in the world in the fifteenth century, and built a navy that could sail the oceans and surpassed what any other nation could have come up with. After a rather short period the project was abandoned, and the Chinese empire did not take control over long distance trade. Explanations usually point at court intrigues in China, but this overlooks the larger picture. The Chinese empire is landbound, built around the large rivers, surrounded by mountains and deserts, and with a rather straight coastline. The artery for trade and other transports was the Grand Canal, from the south to the north. The main explanation is that the empire could control the canal but not the coast trade. The coast was ravaged by pirates, but that could have been handled, but China as socio-political area did not look out to the ocean. The naval expeditions in the fifteenth century forms the exception, and their termination was a return to normality.

In coastbound regions, seamanship is common among the population: a seafarer's career was an option; shipbuilding reached high levels of perfection, and so on. An interesting analysis has been presented by Colin McEvedy. He differentiated between "littoral" and "inland areas", and used a grid, which is the only proper way to conduct this analysis (nations or other units will distort calculations). He defined a littoral unit as a square of land surrounded by the sea on three sides. In an analysis of the Mediterranean in Antiquity, the squares-sides were circa 26–29 km, and thus in a littoral square the sea could easily be reached by foot in one single day.[161] A dominant littoral region was the Greek archipelago, and he also showed a striking fit between the Greek colonies and littoral areas, such as Crimea, southern Italy and Sicily. Also, Cartago with colonies show up on the map, as well as some other littoral regions such as the Bordeaux-region).

His analysis could be applied to northern Europe as well. The Vikings came from three such littoral regions: the archipelago between south Finland and mid Sweden, the Norwegian fjord-coast and Denmark, which basically consists of

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[161] McEvedy 1967 10–11, McEvedy 2002; 10–11. The squares are somewhat larger in the earlier book, and the 2002 publication has a more elaborate map.

island. In a pre-state society, the local seafarers took the lead. This would change with the organized state.

When states and cities replaced rural communities as organizers of shipping, these coastal regions sank into the backwater. However, this type of analysis can be upscaled, using larger squares to identify littoral nations. The presumption is that a littoral state is surrounded by the sea and then turns an overarching interest to controlling that specific space. England is the typical case.

Following the example from McEvedy, I laid a grid over the Mega-continent. One has to consider that the coastline is a fractal, and the scale of maps is crucial. I used a grid, and to identify sea dominated states, sides of the squares were 400 km. The idea was that a medium sized state could be identified as littoral (or in larger states, the most seabound regions). A number of islands and the continental "corners" belonged to the littoral regions (southern India with Sri Lanka, Japan, etc.). Two major regions stood out: Southeast Asia and Europe – as expected. In both these regions maritime transports were highly developed.

So then, why did Southeast Asia not take the lead? The simple answer is that this region had a small population, but that is only to put the question one step away. Southeast Asia is not much smaller than Europe, but the socio-political structure conveyed core regions and large tracts of less populated areas between the intensively utilized core states. Endemic wars also kept the population down. Something similar had existed in Europe, with vast "marks" between the small states, until the High Middle Ages. European feudalism formed a system where the total area was utilized. The "warlords", from a Chinese perspective, existed in a system of balancing transferred power.

There is another side to the European trade expansion that has to be mentioned. Europeans might have held back other parts of the world. The European empires invested in their colonies, in railways and large-scale water management. World economy bloomed, and farmers all over the world could profit (partly it was a movement from below, where famers over the world took advantage of the expanding market). But European empires held back necessary socio-political structural change (and decolonization necessarily broke up the empires). A case in point is China. The Taiping rebellion ought to have ended the Manchu dynasty: their "mandate of heaven" had ended, the population rose and a new dynasty would have come into power – as in Japan. The Europeans intervened and China was held back for many decades.

Appendix C: Material appropriation

The question

Increased material appropriation is a dominant long-term trend and in the main text above this was taken for granted; now it will be regarded as an enigma. I then have to consider the history of needs and wants, but my attempt is far from comprehensive as it is restricted to the question of why increased production of matter has dominated for a long time.

At first the answer seems to be straightforward. Humans need food to survive, houses and clothes for shelter and a number of other items that make life bearable and enjoyable. Contemplating this, we can also conclude that humans do not live by bread alone: they need more than material things. The consumption of non-material benefits has increased in parallel with the main trend and there is an obvious connection as a broad base of material production can support non-material activities such as theatre, religion, etc.

My inquiry starts with some general remarks about the history of needs, and then I turn to population increase and more intense resource utilization. Hitherto, "production" has been regarded as something that results in material objects, but here this term is used in a wider meaning as the creation of what humans want, including non-material products.

History of needs

Let us start with some terminology. The whole set of concepts around needs (wants, etc.) is about consciously formed thoughts and actions. There is nothing of animal instincts in this; even the most biological urges are embedded into culture.

Here these terms are used as a hierarchy from the necessary to the unrealistic. "Needs" are related to what is considered as a necessity, which changes over time. "Wants" go further than that, and include what is not essential to survive (or to live a decent life). "Wishes" go one step further in the direction of what is not easily acquired. "Desires" have a smack of the human tendency to excess, as something dearly wanted or wished. "Demands" is a term that has been usurped by the economists, with the specific meaning of market related enquires.[162] In this text it has another meaning: a request in a negotiation.

Fundamentally, needs are determined by possibilities.[163] Following from the human capacity to imagine, needs and wants and wishes are invented, but not randomly. There is a close relation between new inventions in production and new desires in consumption. A new technology has to be explored from a consumer perspective before its full capacity is realized. Telephones and computers are modern examples; in earlier times new desires in cooking can be seen as another example, such as bread instead of porridge from grain (in Europe).

This relation is much broader: new possibilities urge to be fulfilled. Needs force technology and production to come up with solutions, and solutions lead to evolving needs, in a bouncing back and forth between producing and consuming.

We can imagine the total amount of possibilities and of wishes (expanded needs) as two spaces, possibility space and the wish-space, where the latter is larger as humans wish for more than they can get. The possibility space increases over time, but the wish space expands even faster as every new option leads to several wishes.

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[162] Many economists do not care about needs outside the market, and the dismal thing about neo-classical economy is that it has replaced detailed studies of real situations with models. This branch of social science has no place in the theory kit. Interestingly, politicians use economics as an ideological costume, or straightjacket. Maybe this is what has distorted main stream economic thinking, and it would have been better if they had been free from the political-ideological "demands".

[163] This section is largely based on Myrdal 2008 109–142. There I discussed etymology, and also launched the idea of a possibility space and a wish space, related to each other.

What about distribution? Obviously, we have a chain: producing – distributing – consuming. Better means of distributing products will enhance both ends of the chain, but the creation of utilities is more fundamental.

The next step will be to regard how needs and wants form a system.

A paradigm

A fascinating theory about how needs evolve was presented by Maslow. He thought that needs were organized in a "hierarchy" so that the basic needs had to be at least somewhat satisfied before "higher" needs. The suggested levels were: physiological needs; safety needs; belonging and love needs; esteem/social needs; self-actualization. He added needs for sheer knowledge, for beauty, for the transcendental (religion). His aim was to show how we also strived for higher needs. His suggestion has spread widely, especially in popular culture, and it can be seen as some kind of need-structure.

An obvious critique is that many individuals do not follow the list in order, and can place "higher" before "lower". Maslow himself admitted this willingly, and in a preface from 1970 (to his major book from 1954), he launched another metaphor: the hierarchy is also a "smorgasbord table from which people can choose in accordance with their own taste and appetites".[164] Anyone how has tried a "smorgasbord" knows that if you eat everything you get sick. The cornucopia has to be seen as a menu, to choose from, which also was what Maslow meant. I regard the two approaches as complementary.

Every society has a common need-system, which can be labelled a need-paradigm, because it is closely related to values and norms in a society. Maslow gives us just a few hints as to what to look for. Let us take us take two concrete examples to illustrate such need-paradigms.

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[164] Maslow 1970 xiii–xiv. Economists from the nineteenth century, such as Adam Smith and Alfred Marshal often have often more interesting ideas about the evolvement of needs than modern economists. They discuss how the lowest accepted level changes with new possibilities of consumption. New cloths, new leisure habits, etc., were introduced. A general theory of needs would have to start with them. Neoclassical theories about marginal utility have a restricted value when it comes to explaining how need paradigms evolve; they are more about observing (and make mathematical calculations possible), and less about understanding why people consume.

The first example is from Marshall Sahlins' book about hunters and gathers.[165] He can show that they did not strive to produce as much material goods as possible, which meant that they only "worked" about half-time (three to five hours per day on average). The rest of the time they spent relaxing, talking or doing other leisure activities. Apparently, their need-paradigm included non-material goals. Partly this was because of their nomadic life, that did not leave much room for trinkets and gadgets, but to a high extent it was also because they did not see material goods as the essence of a good life.

The other example is from Early Modern Europe. For a long time, research has shown that the living standard, measured as food consumption, became worse. But the consumption of luxuries increased: tobacco, sugar, coffee, silk became objects for the commoners. Porcelain, and various spices were consumed by a large middle class. Many enjoyed these luxuries (some of them being addictive) so much that they preferred them over food. Such silver lining exists in many cultures and periods, for instance tea in medieval China.

I am far from formulating a theory about how these paradigms take form (world systems, etc.). To formulate a theoretical understanding, one would have to analyse the different aspects, such as sex, food, shelter, status, self-esteem, and so on. Links between them must be identified, such as between the use of clothes for status and shelter. The most decisive part of the theory would be to understand how possibilities tempt people into acquiring more of the same, with ever-lurking tendency towards exaggeration.[166] Instead of a theory, I stick to the question: why do material appropriation and more intense use of natural resources dominate? To come a bit nearer to an answer, let us look at how a need system appears.

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[165] Sahlins 1972. He refers to them as representing a "stone age economics", assuming that this was the normal behaviour before agriculture and states.

[166] Detailed empirical evidence is of course extremely important, and such studies have not been much in the centre of world history research on GNP. As time is the ultimate limit of human existence, a number of time-budgets for different periods would be helpful (for earlier periods experiments combined with anthropology). Comprehensive studies of luxury trade regarding specific products are of importance (it is strange that these are not already at hand). Of course comparative studies, covering large tracts of the world, regarding specific items at archaeological sites and probatory inventories used to construct a long-time line is another empirical fundament. These are only examples.

Appearances

Welfare. Progress is often taken as increased welfare for the masses, measured with national accounts in relation to population.[167] National accounts are based on estimates of total incomes or on the products marketed. These measures tend to underrate a number of needs, and when going further back in time, they are totally correlated to estimates of population. I doubt that much of the estimates of GNP from far back in history that are presented now will survive into the next decades of research.[168]

Combined with other more specific investigations, such as estimating body height, these investigations can show that for a long period after the Late Middle Ages population growth was correlated to a decrease of the average living standard.[169] However, in other periods the intake of food did increase, so we have to analyse this in relation to need paradigms rather than just using a simple Malthusian approach. Around 1900 the West was characterized by a leap upwards in the quantity and quality of food (and later in other parts of the world), which also can be seen as a new set of combined needs in relation to the possibilities (agricultural revolution, and a changed balance of forces between the masses and the ruling elite). Interestingly, during a period when the availability of gadgets exploded, the decades around 1900, commoners choose to eat better.

Engel's law. A regularity in human behaviour, statistically confirmed since the late nineteenth century, is that as when incomes rise the proportion spent on food falls. This is valid from the individual level up to the national level, so that the per capita consumption spent on food decreases with expansion of total production. This regularity is so persistent that it is seen as a "law", named "Engel's law" after

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[167] Noticeable among such attempts is Clark 2007; he is a good historical-statistics "bounty hunter" and his book contains much valuable information, but the analysis is hampered by a narrow perspective. Jones 1981/2003 and 1988 uses the same measure for progress, but with less data and is richer in perspectives.

[168] I know I am nagging, but if these scholars had spent their endeavours on single factors, such as population estimates or gauging trade volumes, world history research would have benefitted.

[169] In Myrdal 2012 243 I have summarized research on body height for Scandinavia, including research I was involved with, and also criticized a well-known and often quoted European overview about osteology, because of the incorrect treatment of the dating of layers, where for instance, the authors claim a dip in the 12th century, which is contrary to what the data tells us.

the statistician Ernst Engel who was the first to demonstrate it.[170]

This regularity has a very long history, as basic food can only be consumed up to a certain level, and with more efficient production, agriculture can sustain more people. Products other than food have increased in spurts since the first states and more complex societies that could offer a growing range of objects (bronze, gems, cloth, etc.).

Three sectors. A common way of understanding a more diversified society is to divide the total production in three sectors: the primary food producing sector, the secondary sector producing other material necessities (such as mining, manufacturing, trade and also building activities), and the tertiary sector which produces services and other immaterial phenomena.[171] This can be seen as a further development of Engel's law, where the third sector has been included as consumption directly related to the social structure.

These three cannot immediately be seen as a hierarchy (in a Maslow-way), because the third sector got a larger proportion during periods of state building.

War and oppression. Power was not only materialized in status, but also in military resources. Organized violence can be costly, especially if in competition with other powers. Time and again these capacities were used for destruction. From a welfare perspective, this part of material appropriation is on the negative side, but from the angle chosen here, we have to include it in the totality. Furthermore, many inventions can be used both for building and destroying (nod to dynamite).

And again, we should not oversimplify. The ability to release violence is not only present on side of the upper classes. In many periods, when the balance of forces shifts in favour of the broad masses, this is combined with new military technology

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[170] Myrdal 2001 is a report I did for the Ministry of Agriculture in Sweden, where I used Engel's law and a long historical perspective to argue that the future for agriculture was to produce new "products", such as animal welfare, valuable landscape, etc. I labelled this "the new products of agriculture", as a kind of counterargument to the ever-decreasing role predicted by Engel's law. Not much came out of this attempt, because it was denounced both from the left and right, but one of my students wrote a PhD thesis about the actual labour needed to preserve landscape. It seems as though ideas come to the surface in other costumes anyhow.

[171] In a study on the sixteenth century Sweden, Myrdal & Söderberg 1991, we used this tripart model to analyse the change, with references to the literature. The main idea was that the Early Modern Era saw an increased role for the secondary sector via the primary, an important step on the road towards becoming an industrialized society.

based on mass armies. A typical example is Late Medieval Europe, where the foot soldier was the backbone of armies that beat elite cavalry, which had dominated in the High Middle Ages.

To summarize: the growth of material products goes far beyond subsistence and a maximum increase of the population. A part of this increase makes life more enjoyable for the masses. A part of it gives the upper classes a life in luxury. A part of it is ideology materialized, such as in monuments. A part is intended for destruction, such as war technology.

Now turning to the two aspects in focus: population and land productivity. The relation seems to be an apparent feedback loop: a growing number of people need more food (and other utilities); more food (and other goods) produced per land unit will meet the swelling needs, and more labour is available to heighten land productivity because more people are at hand. But this does not take into account population increase as caused by societal factors.

Population

Population growth is fundamentally determined by social factors, though external factors such as epidemics or climate also play a role. Restrictions on sexuality and childbirth are crucial, but so are other factors such as the willingness to marry, and use of contraceptive methods. A number of other methods have been used to keep the number of children down, including infanticide and abortion. Consequently, we have to look for societal reasons for population growth.

Possibilities. A steep improvement in food production allows families to have more children and for more young to marry, etc. This is a simple case of causation, where population is the dependent factor in relation to technology, but that also points at family strategies as a crucial factor.

A variant is *filling out the space,* where moving to new areas could be a strategy to lessen demographic restrictions (and vice versa, so available space could lead to faster population increase). The social setting could be that population pressure forced young people to leave and to set up households further away. It could also take form of a group moving, or as a military conquest where a mainly male population took over land and females. This is frontier behaviour, and often a society with more

efficient production conquers and pushes aside existing and smaller groups.

Family strategies. When most children died, one strategy to assure that some survived was to have many babies. During periods of augmented standards of living with less infant mortality, this strategy results in population increase. Increased possibilities open for less birth control during expansion phases, and infanticide or various contraceptive methods (that were always at hand), are mollified. As such societal strategies change slowly, easing restrictions of population increase during an expansion phase eventually gains its own momentum, so that these social strategies lead to a continued rising number of people, even when the economy stagnates. (A Malthusian situation is historically situated.)

Socio-political causes. This is a different kind of causation than that mentioned above, as a large population also entails power resources for the rulers, and to some extent the whole nation. Because a group that outnumbers another will be more successful in a conflict, the group, and especially the rulers, can have an interest in enhancing population growth, and thereby gaining an upper hand in conflicts. This is valid for groups as small as tribes up to large nations, and is characteristic of times of ongoing conflicts.

Another dimension is that in an agricultural system that is demanding of labour, such as wet rice, there is an incitement to have more children. If the production instead is extensive this spur does not exist, and in some production systems, for instance nomadic ones, there is a strong motivation to keep the numbers of children down.

To summarize: All population increase has been determined by technological possibilities and the social structure, together with the specific historical situation. It can never be treated as an independent factor.

We must also note that none of these causations have their opposite tendencies. In a region with longstanding conflicts, a wave of negotiations could follow and show another path for those involved – a path of peace and stability offers no expansions into the living space of other people, and thus the incitement for state-prompted population increase diminishes.

As already mentioned in the main text, one cannot deny the importance of external factors, such as climate and epidemics.[172] Catastrophes could have a decisive importance, but the effect is quite different in an expanding society compared with what happens in a stagnating society.

Land productivity – resource utilization

The vantage point is agriculture, and increased utilization of resources is at first expressed in terms of raising land productivity: how much yield every unit of land produces.[173] Increased land productivity has to be seen in relation to a larger picture of resource utilization, including mining, forestry, etc. Sectors change together, so that increased yield per land unit is gained by more use of iron (and steel). I will look at three aspects: systemic change; land productivity in relation to labour productivity; and the social structure.

Systemic aspects. The long trend sets the agenda for systemic change. Alterations of the production that aim at increased intensity, a rising land productivity, overshadow other tendencies, though labour-saving novelties were also included.

As systemic change is dominated by a tendency to intensity, it attracts such novelties. In the main text I have declared that every system will fulfil its possibilities. Here we make this more specific: *every system fulfils its possibilities according to the dominating tendency.* The virtuous circle moves in a certain direction, and the fulfilment of possibilities in the existing system tend to increase land productivity and other kinds of more intensive use of resources.

Most of the elements connected in the system have the same tendency. Let us look at systemic change in parts of northern and western Europe around the beginning of our era. Cattle sheds were introduced on a larger scale. This demanded more labour, to take care of the cattle, to collect food, and consequently to shape food producing areas (meadows were to a varying degree shaped by humans). Hay-harvest

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[172] Volcanic eruptions have been popular lately among scholars, presumably as we now know more about them, a typical example of how interpretations are steered by new evidence.

[173] Other productivity measures for agriculture can be used, such as the seed-yield ratio, which is of importance if seed is a scarce resource.

demanded so much work that labour-saving implements were also needed (rake and scythe). More intensive care of cattle also meant more intensive use. Both milking and manuring had existed for a long time, but now farmers could take out more of the animals. More manure also meant that the fields could be worked intensively, which was related to change of ploughing (denser). The whole tendency, intensity, marked the systemic changes. In the next phase, the reconstruction after the crisis, in the second part of the first millennium, the changes were instead directed mainly at labour-saving implements (rakes and scythes became better) and other means of making the work process more efficient.[174]

During the longue durée we find this overarching pattern in all systemic changes: a tendency to increased intensity during every large step. This affects all spheres. New levels of people in the social structure had to be handled (the state) and the collective mentality was a part of this (in a more systematic organization of knowledge, new ways of looking at the value of work and also to some extent new theories about nature).

Fundamental to understanding the long-term trend is that possibilities shape needs. This has already been said, but if we chose a wider concern, not only single inventions but a mere totality, one could claim that when iron became the base metal for technology (though most implements were still made wholly or mainly of wood) this created a trajectory of material appropriation among the masses of the population. Stepwise, this increased use of iron (and in connection with that, other tendencies to increased use of resources) became a theme in all technological change up to the industrial revolution.

Note that I do not point at the use of iron as the driving force. What I point towards is that a new universe of possibilities started to open up and be explored. Population growth and more intensive use of resources had been a current in history for long time, what happened then was that this started to flow more forcefully.

Social structure. Let me repeat from the main text above a line of argument regarding the upper classes and control over major resources. If land is the basis for power in a social structure (as the most important long-term investment), further investments

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[174] I discuss this systemic change in Myrdal 1984, and much research has been done since, but often with the intent to show that something existed, not discussing the further spread or prototypes being replaced by more perfect types. I then continued with research on implements, se Myrdal 2005b on the scythe.

in land will be a main societal goal. Investments in land are related to technological possibilities where the new technological complexes coming with iron (and related elements) meant that the landscape now could be transformed in a new and more complete way.

In the industrial society, something interesting happened. Besides an overarching tendency to increased intensity, efficiency gradually came forward as an overarching societal goal. Superficially, this can be discussed in terms of profit as a goal in the capitalist system, but we have to understand it on a deeper level. (Profit is, after all, just a restricted societal goal.) What happened was that technological changed allowed a simultaneous rise of land and labour productivity – or of intensity and effective use of any resource.

This had a tremendous effect on the material appropriation which I just touched upon. The flow of material production hade to be consumed, and we see a system where this is a goal as such.

Land and labour productivity. We now turn to the trade-off between land and labour productivity in pre-industrial societies, which was fundamental for a theory that Esther Boserup launched in the 1960s.[175] With examples, mainly from anthropology, she could show that intensity, more crops per year, less fallow, etc., resulted in an increase of work needed, and thus a decrease of average labour productivity. As a heavier work load was assumed to be something negative for the population, her conclusion was that more intensive farming was introduced when the farmers were forced to do so, and then mainly because of a rising population. Her theoretical adversary was Malthus, whose theory about decreasing marginal production assumed a constant technology, where Boserup pointed out that a higher land productivity could nearly always be acquired with known, but not utilized technology.

Boserup's theory is a generalization, but it cannot be denied that she found a correlation, and her theory gained wide acceptance in the academic community. The notion about known but not utilized technology is in line with the theory kit presented here, and her theory is helpful in understanding why land productivity outflanked labour productivity during a major technological leap. Intensity lowered the average labour efficiency so much that it could not be compensated by some labour-saving innovations.

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[175] Boserup 1965.

Her emphasis on people being forced to introduce intensive technology is more problematic. Both a rising population and an increased production of material objects are societal processes determined by changes in all of the three spheres: the social structure and the mentality system are involved, and not least the new possibilities offered by the changes in the material sphere.

I regard any discussion about the introduction of agriculture, or of industry being historical mistakes as pointless.[176] An opinion is not an analysis. Let us take hard physical work – is that always detestable? The changed mentality in Europe in the Early Modern Period, which has been labelled the industrious revolution, was not totally pressed upon people, but something they came to endorse (partly because they desired consumption), which fed into the leap in total production. The same applies to other periods of harder and more work. It could have a number of advantages to produce more: gadgets and trinkets could be acquired, more children could survive, feasts could be more regular, religious monuments more imposing, and so on. Every step has its pros and cons from different perspectives. (A denser population causes more diseases and also social stress, to mention some of the cons.)

The industrial epoch with its all-encompassing culture of innovation changed everything so that the two types of productivity could both increase simultaneously and a new societal structure (capitalism) gradually made labour productivity the prevailing form.

Labour productivity

The baseline was the long trend towards more intense use of resources, but just as important is the long trend for more efficiency. This was absolutely necessary for increased social complexity, because otherwise more people could not have worked with something other than sustaining themselves.[177]

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[176] The whole idea of historical epochs as "mistakes" brings to mind the biology joke: "Humans were an evolutionary mistake, but that does not matter because it will soon be over." I appreciate this as a joke, but not as an aphorism.

[177] Labour productivity could be gauged with the help of an analysis of technology, and that has been my approach. Other methods could be to measure the proportion of non-agrarian activity. Sometimes urbanization is used as a proxy, but that has some pitfalls. Much non-agrarian activity went on in the countryside, mining for instance. And towns differed enormously. Agro-towns with low population density and dense cities surrounded by a wall are totally different things, and cannot be lumped into one graph about "urbanization".

As mentioned, a certain balance existed between land and labour productivity, as the law of diminishing return affects all resources, including human labour. In a pre-industrial society, more labour per area unit has to be invested to raise land productivity, and average labour productivity normally declines. The substitution is not total, and for instance when new and fertile soil is being exploited, both land and labour productivity could increase, for a time, and when land is becoming overutilized, both kinds of productivity will often decrease.

Land productivity outflanks labour productivity during a major technological leap forward. Innovations aimed at more efficient work processes could play a role, especially in widening bottlenecks when total production was boosted.

Turning to geographical differences, a relationship exists between population density and labour productivity. European mixed farming systems are on average more inclined to labour saving inventions than the Chinese intensive systems, and for instance wind mills were introduced in the middle ages at both ends of Eurasia, but played a much greater role in Europe.

As I discussed in the main text, labour saving technology was of particular importance during reconstructive phases (where there was virtually no tendency to increased land productivity because of shortage of manpower). This could be regarded as a consequence of the focus on increased land productivity during the expansion phase, where these possibilities had been accomplished. Now the time had come to achieve the other type of productivity, which also was prepared the way for the next systemic step in the long trend to increased land productivity. (This could be analysed as a Hegelian thesis-antithesis-synthesis process, but that would lead me astray.)

What we then have in the pre-industrial epochs is a clustering of increased land productivity in the major systemic changes, and a more constant, ongoing process of increased labour productivity in both expansions and reconstructions.

As I already mentioned several times, this changed in the industrial period where both types changed simultaneously. The main goal though was still increased appropriation of material products, and then processes tended to tip over (that is where we are now).

Summarizing the long trend

It is fundamental that possibilities are realized, and technological change opens up a new world of material appropriation. This creates its own momentum, and dominated the long trend for millennia. Population increased and the material capacity became enormous. Humans follow possibilities and explore them to the outer limits (and that will determine the future, but maybe not only in terms of material appropriation – the internet and computer gaming activities point at something interesting, but probably hitherto only in a crude and underdeveloped form).

When it comes to resource utilization, enormous technological advancement has enhanced the total population in a two-way process. An increased number of people, and increased number of items are parts of this.

Sometimes when you address this, an immediate response is: do you want us to return to the stone age and stop development (assuming that development is the same as material appropriation)? Well, we have to ponder the question of happiness, freedoms, capabilities and perhaps only living a decent life. Everything in human history evolves in opposites, and one could argue that we now have many more possibilities (and ought to be happy), but also that the difference between the possibility space and the wish space is greater than ever (and we are haunted by envy and despair over what we cannot acquire). I do not think these are meaningless questions. Humans have to ponder societal goals, especially now when we are coming closer to the end of the long-term trend of more material appropriation.

Just a few concluding on-liners about happiness – instead of an extra chapter. To experience ongoing happiness forever would probably kill the person who was affected (like an everlasting orgasm), so most fairy tales would rather end: "And then they lived sometimes happily". I do not argue for a life lived in poverty, but think about this: to run after happiness, is to search for the pot of gold at the end of the rainbow; to experience happiness is to observe the beauty of the rainbow.

Appendix D: The future

Including a section about the future could seem to go too far, as I more or less have left out the modern periods. But since I have hinted at possible futures several times it seems appropriate to present a more coherent picture. The least dangerous type of futurology looks far ahead into distant times (the author will surely be dead when the forecast can be tested). Pinning down the near future is a more difficult task. Several possibilities are always at hand, and guessing what the future holds is like playing chess: you don't know the next move Destiny will play on the other side of the chessboard.

I have speculated about the distant future (or not so distant) when new goals have been set for the whole human condition, and a reorganization of world systems appears. Contradictions and crisis will certainly haunt humanity endlessly, but in new ways.

But let us concentrate on what is more immediate. First, we have to gauge where we are in the long wave. In my opinion, global society has been in a phase of stagnation for decades. Gross national products show something different, but they leave much of human life to the side. For instance, they do not take any environmental destruction into account (or if they do, it is cautiously and without really estimating the enormity of the destruction). To this comes that long term change is not taken into the calculations. Note that climate change is just one slice of the evil cake we have baked for our children. Problematic from another point of view is that these estimates are not keen on gauging quality. Their results are to some extent illusory, but at the same time the GNP is brutally real because it steers politics.[178] The crisis will (probably) enfold slowly because we are aware of it.

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[178] GNP is a useful tool for some very specific tasks. But many peculiarities make it a distorting tool. For most people, wasting your spare capital, the environment, and claiming that this boosts your income is a strange idea. For most people, work that produces what is considered to be good has to be regarded as production (independently from how they are paid: in the family, by the market, by the state, by cooperation, and so on). I will not waste ink on criticizing modern economists, but will mention that their measures are mostly irrelevant.

In the future they will be dismissed as a part of the wishful thinking of our times. A gradual, dysfunctional reaction has also been sparked since the tax-revolt in the 1980s. Ask anyone how we shall solve the problems we face, and they will answer: by uniting in collective action. And then look how those same people act: with increased individualism. On the positive side, we have insights into the problems.[179]

I see three main alternatives for the near future, the next twenty to thirty years:

1. Continue as we are now, with ongoing and even increased material appropriation. The hope is that new technology will make it possible to continue in this way. New solutions tend, at least in the short term, to cause new problems. To take some current examples: low-emission steel production requires much more energy; electric cars must have batteries, and the use of scarce metals increases rapidly (a problem that presumably will be solved). However, all these technical innovations and other initiatives within the existing paradigm of increased material appropriation is a sign of a growing awareness of the problems, and a wish to escape the dilemma between increased material production and the tendency for environmental destruction. Over a very long-time perspective, humans may find out how to produce energy out of water or air, but presumably this will also cause new and unexpected problems. The basic difficulty will still be how to restrict material appropriation.

Advances will presumably not be sufficient, and certainly not during the shorter time perspective of some decades, especially considering the tendency to spread the wasteful affluence of the West to all of the billions of people in the world.

I hold this alternative to be unlikely as the main solution.

2. Establish a new goal for the society through negotiations, where material production is no longer the prime goal of society, but instead sustainability and cultural appropriation are. In a book about the future published a decade ago (with the next fifty years in its title), I argued for this alternative, because of a

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[179] I am well aware of increased welfare, more democracy, and so on. These improvements have to be balanced against the problems: resource depletion, environmental destruction. The latter gradually undermines the former, and as we have been discussing the crisis before it unfolds, we are also releasing dysfunctional reactions although the stagnation is only partial. An interesting reaction is the wishful thinking related to the wave of lies that we are experiencing in culture and politics.

peculiarity of our time: we discuss the crisis before it occurs. For more than half a century this has been a dominant paradigm in societal debate, starting with the nuclear threat but gradually extending to other aspects of society at large. I assumed that this specific discourse would facilitate action before crisis, and my explanation was that the threats humans were facing were so devastating that humans had to act before serious difficulties affect their lives.[180]

I now hold this alternative to be less likely, and I am inclined to claim that alternative three is pushing to the foreground.

3. This alternative is what has been claimed in the theory kit as the norm in human history. Stagnation goes over into serious dysfunctionality, and then into deep crisis. In a not-too-distant future, much of human society will have reached an environmental brink (and this will be at a time when dysfunctionality has diminished free resources).

For our time, when human have so much power and control over the environment, this could have effects as never seen before in any crisis. Tracts are made inhospitable, which causes mass emigrations and possible conflicts. Political leaders have abstained from nuclear war so far, but perhaps not for long. Inequalities could grow together with economic depressions, and many may crave dictators that only will worsen the situation. Wars, destruction and oppression, and we face a wreck. Contrary to this, one could rightly claim that humans have such a high level of technology and social complexity that reconstruction after a breakdown will be fast (as in Germany after WWII).

A spectrum of alternatives opens up before us, and what will really happen is neither the best nor the worst alternative.

Considering that alternative 2 is a possibility, bubbling beneath the surface, I reckon that number 3 will not unfold to its full catastrophic extent. Alternative 1 will smooth the changes out. The most probable future is thus a combination, a merging of alternative 2 and 3, including parts of alternative 1.

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[180] Note that this awareness of an impending crisis is not the same as the idea of a doomsday, when God/the Gods reorganize everything. What we are discussing now is humans and their role, without much involvement of supernatural beings, though of course for some religious explanations can be important, but only for understanding or dismissing the problems.

The reconstruction will inevitably be a fulfilment of alternative 2. No other way is open for humans in the distant future. And that opens the way for a new eon. Humans have reached a new level of self-consciousness and responsibility, although the transformation from one set of goals to another will be very difficult.[181]

[181] Teilhard de Chardin 1965 has reasoned about this in a more open way than most other scholars, and you do not have to be religious to consider his ideas as interesting,

Appendix E: Going deeper

An undercurrent to this whole book is the idea of a dialectical in human history flows, and here I let it surface shortly to understand the foundations for change. Everything in human history entails opposite tendencies and nothing is constant. This is a given consequence of the human way of thinking, and nothing even close can be found among other animals.

Now let us consider a "thing" and its "parts" in a human setting. This is an equivalent to the relation between world systems and regional systems, but is more abstract and encompassing. All "things" are now included on every level. This whole, the thing, consists of parts, or elements. But these can also be seen as tendencies, as they are under constant transformation. And continuing with the abstraction, they can also be seen as contradictions with dominant sides.

Elements = tendencies = contradictions. This is not the place to delve into to this; at this point we just have to accept that this the human world we live in.[182] It evolves in sequences of thesis – antithesis – synthesis. To find the fixed point is to observe it moving. Everything is in flux, and yet to understand, we have to consider fixed systems, otherwise we cannot perceive them.

To understand how dialectics work, would need a long text, but a hint is given in figure 4, which is from my contradictory-thinking book. It is just a cross-section of the relation between the whole and the parts, but only considering one dimension: how the whole and the parts build each other. The parts build up the whole, and

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[182] In my contradictory-thinking book, Myrdal 2006a 81–85, I us a Hegelian jargon, about a whole and is parts concerning a specific aspect. Following Hegel, I talk about the main contradiction as the generalized element in the overarching system (a thing), which influences all sub-contradictions, that are more specific expressions of the studied aspect, and in this relation "force" is exchanged between the higher and the lower level. The force is used by Hegel with different meanings, depending on the level of analyse. And I leave it there, but admit that the idea of everything being/containing its opposite is one the most beautiful thoughts I have ever come across.

are bent by it. The whole is shaped by the parts and bends them. The parts are here not shown as a grid, though strong contacts exist between some of them (a structure, or a complex). They are all shown as wholes in themselves, but also as tendencies, and contradictions (arrows). Within this, not only the parts that form essential elements in a technological complex are included, but also those on the fringe of the complex, and even the suppressed parts with a different main tendency than the whole – and all have to bow to the force of the totality.

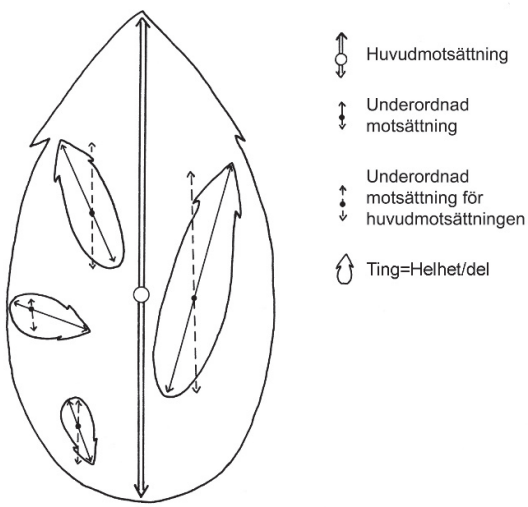

Figure 4. A whole and its parts, described as tendencies and contradictions, building and bending each other. From Myrdal 2006, 82.

Showing this, just as a glimpse of a larger scheme, does give an awareness of how change comes. If everything is moving, then at certain periods the whole can change direction because its parts have developed. It can even switch if the other sides in the contradictions become stronger.

Now if we get back to more concrete levels of reasoning, this implies that a world system is built by regional systems (or domains) and to a certain extent influences them. To take the rice example again – rice will also be grown in places where other crops may have been more suitable regarding soils and climate, because of the overarching system. This is the strength, but of course also the weakness, of a system.

Appendix F: An ode

In Myrdal 2008a every chapter commenced with a stanza, related to the content of the chapter and as a poem explaining some core issues in the theory about dialectics in history and the inherent paradoxes of human history. I wanted to really lay forward that human beings do not build and live in a beehive or an anthill; we create and populate a changeable society in the context of our cultural history.

An Ode – On the self-creation of humankind

The human capacity to imagine what does not exist, to think into being, means we never live only in the present. In our thoughts, we abide in times past and yet to come: we remember and we plan.

The human capacity to imagine what does not exist, to think into being, means our thoughts and actions are lead far beyond what is already there. We go outside ourselves, we pursue our vision in practical actions, often going to extremes, which are also the basis and the triggers for reaction – and so we create ourselves, through the struggle of thesis and antithesis, in the practice of our lives.

The human capacity to imagine what does not exist, to think into being, means we can also imagine away what does exist. Coupled with the inherent tendency toward extremes, this ability is one of the bases for recurring crises.

The human capacity to imagine what does not exist, to think into being, means human history crosses the boundary from biological determination to cultural determination: from this flows the expansion we term the development of cultural history.

The human capacity to imagine what does not exist, to think into being, means that we can find solutions to problems and needs as they are defined. This ability to solve problems evolves in stages: only when an idea has been tested in practice can the following idea be born and examined.

The human capacity to imagine what does not exist, to think into being, means that we have the ability not only to find solutions, but also to find new needs and wants. This is the beauty and the burden of humanity; it is our triumph and our trap.

The human capacity to imagine what does not exist, to think into being, means we can also see our own tendency towards extremes and so we try to set limits to balance our needs between wants and norms.

The human capacity to imagine what does not exist, to think into being, is also to conceive of the thoughts of others. This is actually not only an ability, but also a compulsion, so that none of us become something only within ourselves. People think and execute in relation to other people: we are reflexive herd animals, and so the norm system is constantly changing.

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Janken Myrdal is Professor Emeritus at the Division of Agrarian History, Swedish University of Agricultural Sciences, Uppsala.