

WORKING PAPERS ON
CAPITAL AS POWER

No. 2018/04

**The Autocatalytic Sprawl of
Pseudorational Mastery
(version 0.12)**

Ulf Martin

June 2018

<http://www.capitalaspower.com/?p=2503>

The Autocatalytic Sprawl of Pseudorational Mastery (version 0.12)

Ulf Martin

2018-06-11

Contents

1 Introduction	2
2 Power, <i>Gestaltungsvermögen</i> {sec:power}	2
2.1 From wealth to <i>Vermögen</i>	2
2.2 <i>Gestaltungsvermögen</i>	3
2.3 <i>Gesellschaftliches Gestaltungsvermögen</i>	3
3 Social imaginary significations	4
4 Modern Rationality and rational mastery {sec:rat}	4
4.1 Modern rationality: operational symbolism	5
4.2 Predecessors to operational symbolism: ontological and magical symbolism	5
4.3 Operational symbolism and autonomy	7
4.4 Two modes of rational mastery: capital and bureaucracy	7
5 Property, credit, money	7
5.1 Property	8
5.2 Money creation through credit	8
5.3 Institutionalisation of money creation	10
5.4 Credit paper as second order property	10
5.5 Credit operation and risk creation	11
5.6 Autocatalytic sprawl of credit and accumulation	11
6 Bureaucracy	12
6.1 Bureaucratic capitalism	12
6.2 The phases of global capitalisation	12
6.3 The autocatalytic sprawl of bureaucratic organisation	13
7 The interaction between bureaucracy and capitalisation	14
8 Systemic crisis or autocatalytic agony?	15
9 Way out? Autonomy and operational symbolism	16
9.1 Inspirations from the Athenian polis	17
9.2 Inspirations from CERN	17
10 References	18

Achtung! This text presents its ideas often more as a kind of synopsis than as a well formulated argument. Future versions of the text will try to remedy this defect. Note that the version number is part of the title. It is recommended to quote this text including the version number and check for new versions before quoting.

1 Introduction

According to Shimshon Bichler and Jonathan Nitzan *capital* is not an economic quantity but a mode of *power* [29]; it could be summarized as: “Capital is power quantified in monetary terms”. So, what do we do when we “quantify”? What is the nature of “money” in a capitalist society? And, indeed, what is “power” in the first place?

In the following I will try to develop a concept of power as the ability of persons to create particular formations. The kind of formations persons can think of depends on the society a person lives in, which can be identified by what Cornelius Castoriadis called its social imaginary significations (SIS). The core SIS of capitalism is *rational mastery* operating with computational rationality. Computational rationality in turn rest on a particular understanding of how signification works: operational symbolism, as theories by Sybille Krämer (following Leibniz). When the concept of the SIS of modern rationality was developed in the 1950s and 60s, bureaucracy was seen as its main organisational mode or rational mastery. I will argue that capitalisation *and* bureaucratisation are the *two* modes of rational mastery which interact with each other. The paper concludes with deliberations on the future of rational mastery and the possibility of “ways out”.

2 Power, *Gestaltungsvermögen* {sec:power}

2.1 From wealth to *Vermögen*

In English, of persons who own a variety of *assets* which have a certain monetary value, one says that they have a certain *wealth*. In English it is not clear how wealth “as such” should relate to power. The situation is different in German: the direct translation of “wealth” is “*Vermögen*”, sometimes even “*Kapitalvermögen*”. You say, Mr Gates has a *Vermögen* of \$100 billion etc. Now, *Vermögen* is also used more generally to denote *ability* to do something, the “power to...”. Indeed etymologically *Vermögen* belongs to the same group as does the German *Macht* which is the direct translation of “power” especially in political contexts. These go back to the Indoeuropean root *mag^h* which means *ability* or *power*, and from which derive all kinds of related English words like *might*, *mechanics*, *machine* and many others, even *magician*; there is also the closely related root *mag^h* which means fight or struggle [24].

So, in German “capital is (identical to) power” is already built into the language (an etymologically English equivalent to *Kapitalvermögen* would be *capital might* instead of wealth or asset). The usage of *Vermögen* for financial wealth apparently seems to have started around 1500 [38]. This is the age of German protocapitalists, most notably Jacob Fugger of Augsburg (1459–1525), whose byname was “the Rich” and who, at the end of his life, controlled 70% of European silver production, silver being the foundation of the hard money of the age. The ability of Fugger and other rich men to turn their business success into political influence (Jacob Fugger was responsible, i.e. payed for, Charles V to become emperor of the Holy Roman Empire (HRE) in 1519) in an age that was otherwise still feudalist, was reflected in the “folk books” (early popular printed story books) of “Dr Faustus” (about the magician who seeks power by a pact with the devil) and “Fortunatus” which plays out the possibilities its main character has with a purse which contains money each time he opens it [34].

2.2 Gestaltungsvermögen

So now we have Vermögen, the financial wealth as well as the ability to... But to what? Very generally we can say: the world changes. Say that at some time t_0 the world is in a state s_0 . Without action of person p the world will be in state s_1 at t_1 , the trajectory from s_0 to s_1 could be called the “curse of events” (*Lauf der Dinge*). Assume p wants the world to be in state s'_1 instead. If p can act in such a way as to actually achieve what they want, we would say p has the ability or Vermögen to do so. I shall call the act of altering the curse of events an *act of formation*, or *Gestaltungstätigkeit*. In this context, form / formation / Gestalten are to be understood very generally as genuine acts of creation, not just changes of something already existing (this is more natural for “Gestaltung” than for “formation”).

(At this point, I avoid Bichler/Nitzans term “creorder” [29], partly because I have been unable to find a good translation into German, but also to underline that a Gestalt/formation need no be fully ordered: Gestaltungstätigkeit may create *disorder* as well.)

Adding to this that since things do not change by themselves as the acting person want (otherwise that would be the natural curse of events and no action necessary), hence they have to overcome resistance. Running this together we get power = the ability to create formations against resistance which otherwise would not occur = Gestaltungsvermögen (“formation-ability”). This is a very general definition and, when applied to formation in the physical realm, can be translated one-to-one into the physical term power = energy per time, energy being, so to say the (quantification of the) amount of what there is to do and time how quickly the action is necessary.

2.3 Gesellschaftliches Gestaltungsvermögen

In society (social formation-ability, gesellschaftliches Gestaltungsvermögen), the wish of p^1 for the state of affairs at t_1 to be s_1^1 (instead of s_1) may meet another person p^2 who would like that state to be s_1^2 . If the two states differ, a conflict arises, a power struggle. And of course the two may not be alone. Hence, the social power of any person p is the ability to overcome the combined but not necessarily coordinated resistance of all other persons with respect to their goals. The goal may be “greater” of “smaller” i.e. the intended state of the world may be further away or closer to the curse of events. The further away the more other people are involved / affected hence more resistance is to be expected and hence more power necessary to overcome it.

We can now say that capitalisation is the quantification of the otherwise only qualitative notion of “greater” / “smaller” with respect to what goals can be achieved: in a almost fully capitalised world Bill Gates with a Vermögen of \$100 billion can realise any project for which facilities costing that order of magnitude can be bought, which is of course more than someone with only \$1 income a day. The quantification is necessarily relative since social ability is relative to social ability of others. And once power conflicts have started there is a “natural” tendency to turn everything into a means to those conflicts, hence the tendency for the “capitalisation of everything” [29].

We note that the concept formation-ability and the respective formation action (Gestaltungstätigkeit) are neutral with respect to whether the action is productive or destructive, which are evaluations which may differ from the point of view of the different persons. From the point of view of rulers the destructive capabilities of an army under their command are productive with respect to their quest for power, whereas the productive capabilities of a plant of the enemy is destructive for their power.

3 Social imaginary significations

In the previous section we have defined power as the ability to achieve a goal against the resistance of others with competing goals. But what goals can a person in a given society *imagine* to achieve? There are two questions here:

- a) what can people imagine is *achievable* (in principle)? and
- b) of what is imagined to be achievable, what is *worth* to achieve?

The first denotes the limitation (or extent) of their (ability of) *imagination* (*Vorstellungsvermögen*), the second denotes the meaning or *signification* (*Bedeutung*) of peoples actions: not everything imaginable is worth doing. I think this is roughly what Castoriadis has in mind when he says that each society can be characterised by its “social imaginary significations” (SIS): it is the coherent set of what its members can imagine and what they think is worth doing and what not [6,11,12].

More generally, the SIS is the idea (*Vorstellung*) that members of a society have about the world order (it is their cosmology or *Weltbild*) the meaning/significance (*Sinn*) of their lives, what they should do, of that of others, of the institutions, and the world as a whole. The SIS drives human actions and hence the generate the process of social change, the “socio-historic”.

Typically, an SIS is closed and include a cosmology: it offers an explanation of anything that happens in the world. Furthermore SIS are typically thought to be external to the social process: the world and social formation is *thought* to be given by God, the forefathers, human nature and so on. That doesn't mean the social order is *actually* something external, it is only imagined to be. Castoriadis calls such SISs *heteronomous*. Heteronomy implies that there is no real distinction between nature and society (physis and nomos).

If the members of a society are conscious of the fact that they themselves are the creators of their social order we have the SIS of *autonomy* (from *auto*, self, and *nomos*, social formation). Autonomy breaks the closedness of the SIS and the members of an autonomous society can take advantage of this break-up to consciously create and change the social formations according to their will, this is “true politics”. Autonomy raises the question of how far the conscious creation process can go, or what things can't be changed due to their “nature”. Hence, autonomy is the discovery of the physis / nomos difference. By implication, science, the research of the natural environment and hence the extent of physical formation ability (*Gestaltungsvermögen*) becomes a socially relevant activity.

Autonomous humans reject authority. They are equal with respect to their participation in political affairs. (But some may be more knowledgeable about special subjects than others.) This implies that there must be a truly political sphere in an autonomous society where its members cannot just discuss but also decide on the questions concerning the nomos a public/public sphere, the *ecclesia* (Castoriadis).

4 Modern Rationality and rational mastery {sec:rat}

According to Castoriadis Western modernity can be characterised by the double SIS of *rational mastery* and *autonomy* [8].

Rational mastery = rationality + mastery is a compositum. I do not think that modern rationality as such implies mastery. Mastery when combined with rationality has two aspects: the idea that humans can master nature including their own human nature and that this can be done “rationally”. This turn means into end: the idea that rationality (a rationally ordered society) is a goal rather than it being the most

effective way to achieve something that has been decided on (e.g. by the citizens on an autonomous society).

4.1 Modern rationality: operational symbolism

According to Sybille Krämer modern rationality is computable rationality/reason (*berechenbare Vernunft*) [25,26]. Computability = ability to turn an argument into a calculus (*Kalkül*). The algebraic formula is the archetype of such a computable form.

4.1.1 The calculus

In a calculus,

- a) the construction of symbols and their interpretation are decoupled. The allowed operations do not depend on what the symbols are supposed to mean in the end.
- b) Language becomes a technique (*Technik*); formal artificial languages, *syntactic machines*, can be constructed.
- c) Symbols become manipulable objects.

4.1.2 Leibniz' theory of symbols

The theory of symbols which can (and should!) be used for rational calculation (*calculus raticionator*) was developed by Gottfried Wilhelm von Leibniz (1646–1716).

- a) Symbols are objects that are manipulated according to some rules.
- b) Symbols are autonomous with respect to what they signify; they become a calculus, a formal system whose inner order is independent from the interpretation of the symbols; and the symbols appear in a new kind of script, the typographic script, which is independent from spoken language.
- c) Calculisation and typographisation turn symbols into mechanical production systems, *symbolic machines*; artificial languages are a technology.
- d) Scientific thought produces knowledge (*Erkenntnis*); since knowledge production requires symbols, as a consequence of the above, knowledge is the product of the operation of symbolic machines.
- e) As a consequence the objects of knowledge (*Gegenstände der Erkenntnis*) themselves are also generated by symbolic machines.

The term *symbolism* denotes the theory of what and how symbols signify (how the “get their meaning”). If the signification is the product of some operation according to some rules we can call this theory of signification *operational symbolism*.

If one generalises the concept of symbolic machines to language as a whole we get roughly Wittgenstein's concept of the language game of the Philosophical Investigations, that is, the meaning of words depends on how they are used according to more or less (formally) defined rules [31,35,37].

4.2 Predecessors to operational symbolism: ontological and magical symbolism

It is useful to contrast operational symbolism with its predecessors in the Western history of ideas (philosophy). Western philosophy only concerns us here: capitalism is a product of Western civilisation and the autonomy project (according to Castoriadis) only emerged twice, in ancient Athens and with

modernity but not by themselves in outer-European contexts. (But in today's globalised world everybody could participate of course)

The immediate predecessor of operational symbolism was *ontological symbolism*, as conceived by Plato and Aristotle: the significant of a symbol is an "ideal" object. The model of this symbolism is geometry (hence, only those who have studied it are ready to enter Plato's academy): a triangle drawn in sand is murky, imperfect and so on, but "represents" or refers to the ideal triangle that the drawer "means". By way of generalisation, words ("table", "red", "zero",...) denote an ideas which only "somewhat" fit to the murky reality (reality is imperfect when compared with the ideal world of pure ideas). Since the ideas are thought to be located somewhere the question arises about their "ontological status", hence the term ontological symbolism.

Ontological symbolism has intrinsic problems (some of which were already identified by Plato himself): where, exactly, can these ideas be found and how do we "access" them; what is the reality of ideas about fictious or impossible objects (unicorns, circular squares); same question for negative or non-existent objects (what does "0" signify, how is it possible that adding zeros, signifying nothing, at the end of a numeral increases the number signified?); what is the idea of an idea (the idea not of a "table" but of the "idea of a table"), and doesn't that lead to an infinite regress? What about all the words in a sentence that do not have clear "ideas" behind them (particles, words like "here" and "there", and so on; the logic of ontological symbolism, developed by Aristotle, only deals with subjects and predicates).

Ontological symbolism itself was the solution to intrinsic problems of its predecessor, *magical symbolism*. Here the signification is thought as a "link" from the symbol to what it represents within this world. For example the name of a person is "tied" to its bearer, as is a puppet when used by a voodoo priest. In a sense there is no difference between symbol and its significate. But this direct-link hypothesis breaks down with abstract objects when there cannot be shown a direct link to exist. In Ancient Greece the discovery of the "symbolic difference" (Krämer) was due to the Pythagoreans, when they were unable to construct mathematical objects like the square root of two by the manipulations of pebbles (their way of doing math). In a more general context, this type of symbolism operates with concrete prototypes (e.g. in order to classify an object as a table one compares it with some prototypical object which is known to be a table). The problem with a concrete prototype is that they have an infinite number of concrete particular properties yielding the question why a particular object is the prototype and not some other. The symbolic difference of ontological symbolism implies an ontological difference (ideal vs. real world).

The change from magical to ontological (Ma → On) as well as the change from ontological to operational (On → Op) took place in the context of the autonomy project: MaOn in the context of Athenian democracy, On → Op in the European enlightenment, that is, the modern autonomy movement. Autonomy rejects that experts decide on matters that concern the entire society (but experts maybe necessary to implement decisions taken). But decisions require classification using words (in a debate) and hence the quest for a democratic symbolism arises.

Magical symbolism requires experts (priests) to distinguish prototypes from other objects. The concept of ideas ideally implies that everybody has equal "access" to them (but this may require training, i.e. education in geometry; Plato thought that the access to the ideas was lost through the shock of birth and could be brought back by "maieutics"). However, since the ontological problem, the question of where the idea should be localised, was never solved and eventually Christian ideologues put back the priest expertism into force (according to Augustinus the ideas are to be found in the mind of people by the unlimited benevolence of God but only of true Christians — which is why it is nonsensical to have a serious discussion with heathen for they have not profited from that benevolence so far).

4.3 Operational symbolism and autonomy

Operational symbolism does not suffer from an access problem: there is the symbolic difference but no longer an ontological difference. Ideally, anybody can learn the “state of the art” in science and can contribute to it by constructing their own “symbolic machines”. And there is no creative limit in what symbolic machines can be created. Older symbolism were tied, so to say, to the actual world, they were static. Operational symbolism is dynamic.

Modern science is part of the autonomy project because

- a) it is ideally open for the contribution by everyone who makes the required effort to learn the state of the art;
- b) its results are relevant for the possibilities of the formation of social order, i.e. what is possible to achieve physically (the physis / nomos difference);
- c) modern rationality (symbolic machines) do not limit creativity (the explosion of modern mathematics is an example: any set of axioms is effectively such a machine).

4.4 Two modes of rational mastery: capital and bureaucracy

Modern rationality becomes the antithesis to autonomy when it becomes an end in itself and enters the hubris of unlimited mastery. That is, when the social order should be the implementation of some kind of imagined rationality (rational order). Example: typically, modern utopias, like those of Morus et al., present the contradiction: one the one hand, the societies are conscious creations of its citizens but at the same time they implement some kind of “objectively” rational social order. The self-referential application of rationality as an end in itself plus hubris is the “mastery” aspect of rational mastery.

I propose that there are two modes of rational mastery:

- a) the extension of the command of property and its monetary quantification, or *capitalisation*.
- b) procedural rationality institutionalised as *bureaucracy*: an organisation’s rational goals are calculated and implemented using formal procedures by an hierarchical organisation which is created according to alleged rational principles.

The two modes exist side by side to each other, indeed, capitalising organisations (e.g. corporations) are typically internally organised as bureaucratic hierarchies, and there are “feedback mechanisms” between the two modes (see sec. 7).

Rational mastery is actually a pseudorational pseudomastery: it is not rational and it fails because of its own operations. As we will see it is also autocatalytic: the process of increasing rational mastery yields its own growth.

5 Property, credit, money

Capitalisation is defined as

$$K = aE,$$

where K is the capitalisation in monetary units, E is the (expected or past) earnings in monetary units, and a is the product of accumulation factors (pure numbers) [29]. In the present analysis of Capital As Power, the accumulation factors are hype, inverted risk, and the reciprocal average rate of return. We note that by the very fact that that the capitalisation is an algebraic formula capitalisation is a symbolic machine in the sense of S. Kräamer. But capitalists do not just generate knowledge by capitalisation

(although any such number conceptually contains the observations of how a capitalist sees “all” of society, like a hologram does [29]), more importantly, they try to make things happen that is they exercise mastery on society. Thus capitalisation is both, an “engine” *and* a “camera” but, indeed, mostly the former [28]. Earnings may be expected future earnings (but in times of “systemic fear”, past earnings [5]). Just like formulae in science are inventions of scientists which are “tested” by empirical observation (= another set of formulae), capitalisation is an operation done by business people etc who “test” if it works out or not.

What we need to understand is, how money and property are “linked”. The subsections up to sec. 5.3 I will develop the property theory of money as developed by Gunnar Heinsohn, Otto Steier, and Hans-Joachim Stadermann [22,32,33] in the context of Capital As Power (see now also Graeber [19]).

5.1 Property

Property / ownership, legal definition: *Ownership is the right to enjoy (use) and dispose of things in the most absolute manner, provided they are not used in a way prohibited by statutes or regulations* (Code Napoléon, Art. 544 [27]). As with Vermögen, in German things are even more explicit. Again, the German legal conceptualisation is even more explicit: “*Das Eigentumsrecht ist ein umfassendes Herrschaftsrecht*” (property is a comprehensive right of domination / rule [39,40])

Observations:

- a) The definition in the Code Napoléon is the prototype of bourgeois, hence capitalist property law (but the definition goes back to the Romans).
- b) The definition distinguishes two distinct rights, the right to *use* (“enjoy”) and the right to *dispose* of things owned.
- c) Owners may *dispose* of things as follows: they may *commodify* them, i.e. sell them against payment (in which case the things are not longer owned by them of course); they may *rent* them for a fee (in which case someone else “enjoys” them); and they may *collateralise* them in a credit contract in addition to renting or using them. Collateralisation is independent from who uses the things.
- d) It is the right to dispose of things, which include the right to generate earnings from them.
- e) These rights may be exercised “in the most absolute manner”. In feudalism, property rights were always particular rights, restricted by tradition, religion, customs, etc., any use outside those restrictions could nullify the ownership right.
- f) Restrictions must be explicit laws made by the state. But the bourgeois state itself is a creation by the very property owners who subjugate themselves under its law. Hence the fights over restrictions, whether to impose them or not, becomes part and parcel of business operations = differential accumulation.

5.2 Money creation through credit

Modern capitalism starts in the city states of late Medieval and Renaissance Europe as business done by merchants who formed networks of “consenting owners” (often parts of very few families) extending across European cities and courts. Within these networks business could be done via debt records (tallies) and clearings or negotiable instruments (the money of the merchants) which was safer than actual valuables like silver coins (which could be stolen and needed to be handled and transported). In order to be “eligible” as a debtor a merchant needed property as collateral. Certificates collateralised by property can circulate as money. We can distinguish debtor’s money and creditor’s money.

Suppose we have an owner of an “interesting” object, say a silver mine. The owners would like to exploit the mine (“enjoy” digging out the silver in it). For this equipment and miners are necessary which may

come from places far away. Suppose the owners have no money or other valuable goods to pay, what should they do? They could issue notes backed up with the silver to be digged out. This way the mine owner would be a debtor who issues notes backed by their property. This is *debtor's money*.

Suppose that the mine owner is relatively unknown outside its neighborhood. In this case they would have problems getting their notes accepted outside that neighborhood. Now suppose there is a rich well known merchant house in the neighborhood with branches in many outside areas. The mine owners could now go to the merchant house and ask them to supply notes promising its bearer to pay a certain amount of property, a promise backed by the merchant houses property, assuming that such notes would be accepted thanks to the reputation of the merchant house. The mine owners will need to promise to pay back the value of the bills (e.g. in form of the silver digged out). The merchant house will ask in return, for (a) some extra payment, the *interest*, and (b) some property (e.g. the mine) as *collateral / security* should the mine owners fail to pay. In this case the merchant house is the creditor of the mine owners, and the bill issued is *creditor's money*. It is this type of creditor's money which got the early banking houses started in Italy from the 14th century.

Let us note several points:

- a) The obligation of the debtor who receives the bills from the bank, as well as the amount one on the bill are *nominal units*. If the bill promises to its holder "one florin" any items worth this amount may be sufficient.
- b) Both, debtor as well as creditor are owners of property. In early banking (indeed until almost the 20th century) non-owners are not creditworthy. The whole point of the operation is that both remain owners of their respective property. They dispose of their property in such a way that they remain both in possession and disposition of their property.
- c) There is the default risk, the danger that the debtor cannot pay back its debt which is bad luck for the creditor, especially if the debtor's collateral turns out not to be worth the amount credited. Typically, the creditor may ask for different collateral or change the credit arrangement. The latter is particularly the case with credits to sovereign. (The Bank of England was effectively created when after a lost war with France the creditors to the crown demanded other means of being repaid — thus was born the eternal state credit, taxation and the lottery of England.)
- d) It is also possible that the receivers of the merchants bills immediately turn to the merchant and demand the promise to be payed. The "art of banking" consist of this *not* happening: if the bank is very trustworthy it may be much more useful for the owner of its bills to use the bills for their own business as a means of payment. Once this procedure is institutionalised bank notes can become "legal tender".
- e) The possibility of the notes promise asked to be fulfilled, however, created the need for the bank to hold back enough own property to eventually fulfill such demands. Hence a certain fraction of the banks property is "locked" to "secure" the bills issued.
- f) *Interest* is charged because otherwise the owner (merchant, bank) would simply not be "interested" in giving credit. Interest is a "premium" for the collateralisation of property, hence a "property premium" [22]. As a consequence there is no property-based money without an interest. A risk premium may, of course, be charged in addition to make up for lack of information about the debtor and/or his collateral and of general circumstances which are always mostly unknown ("fog of business" to take up the respective concept from physical power struggles [14]), or for the risk of holders of the bills asking for their promise.
- g) There is the story that in England gold smiths were some of the first bankers who used gold deposits of their customers (made to secure them) as a collateral for issuing bank notes. According to Heinsohn/Steiger this gold smith's story is often confused. Those banks were set up by wealthy owners who put in their *own* property.
- h) What happens if a holder of a note offers it to the issuing bank? Instead of fulfilling the promise of

payment (which threatens the property base) the bank may offer to record the sum in an account for that person and pay an interest, i.e. a premium for non-fulfillment. And since there will be a greater promise at the end of the period the bank can only prevent payment by promising the interest on the account for the original sum plus the interest promised so far, thus leading to the phenomenon of compound interest.

5.3 Institutionalisation of money creation

When the monetisation of society became the rule, there was an increased the threat of holders of bank notes demanding payment of the promise thus ruin the bank (e.g. the free banking era in the USA up to the 20th century). Thus the money issuing institution needed be shielded from direct contact with society at large. The crediting operation was separated from the money creation: a reserve system was created, where a central bank took over the money supply to commercial banks who continue to do the ordinary the credit operations. But also money supply itself remains a credit operation: commercial banks receive money from the central bank against assets deposited, and pass on this money to customers. This way commercial banks can become modern corporations and hence part of the game of differential accumulation.

The debtors's obligations were made transferable which turned them into commodities, e.g. "bonds". With the emergence of public banks, states would take credits from them against bonds whose interest would be paid by money (issued by the same banks) raised from taxes [15]. The state thereby enforces payment in the money issued by the law. If a taxpayer does not pay, the state would enforce its demand by seizing some property. This way, the entire property base of the state (and subsequently capitalist society) becomes the collateral to the money issued by central banks.

5.4 Credit paper as second order property

The owner of a bond will treat it as a normal asset, i.e. as part of their Vermögen (the interest are its earnings), which may be disposed of as collateral in a credit operation. When commercial banks demanded money from the central bank until recently sovereign bonds were usually handed in (or at least promised) as collateral.

Bonds and other such transferable credit paper specify a right to the interest payment. This is earnings from an item owned, the operational definition of property. Thus, a credit paper, while actually based on (collateralised by) property becomes property itself. As such, it may itself be used as collateral for a credit operation. In particular, bonds of states with

- a) an extensive property base, i.e. much private ownership and a legal system which supports and defends private ownership,
- b) enforceable taxation (against that property) ,
- c) fiscal policy with low risk of state default,

a generally thought of a best possible collateral.

Money, the means of payment, emerges out of credit operations backed by a societies property base. But the transferable credit papers themselves become a property base of second order which may be used for further credit operations. And these in turn may be used the same way and so on.

5.5 Credit operation and risk creation

The fact that money is created only if there is a property backup and an interest payment in money means that taken together the money available in a society is necessarily insufficient to pay off all debt plus interest. This means that there must be some debtors who find it difficult to raise the necessary money by the business operation underlying their credit contract. They need to be inventive. But this changes the social (and physical) formation away from what it was when the credit was contracted, the “assumptions” underlying the contract change. This creates a particular kind of risk: the risk which is generated by the very credit operation itself. There are of course many other risks i.e. unforeseen events.

In order to “manage” the risk of their debtors default they may buy a kind of insurance paper: e.g. some other party may offer a paper whose issuer promises to take up payment if the debt defaults against a small constant fee. Thus we enter the world of financial derivatives.

Another way of trying to overcome the risky ever changing world is to fix prices in the future (futures contracts), i.e. to assume away that the world will change from now to when the payment is due.

Each of these derivatives, indeed what makes them actual derivatives is that they:

- a) are based on some underlying contract (which may itself already be a derivative),
- b) specify a right to earnings, sometimes conditional on some externality, and hence
- c) are property, can be sold or otherwise transferred or used as a collateral in yet other credit operations.

5.6 Autocatalytic sprawl of credit and accumulation

“A single chemical reaction is said to be *autocatalytic* if one of the reaction products is also a catalyst for the same or a coupled reaction. Such a reaction is called an *autocatalytic reaction*.” [41] We observe that credit operations with transferable notes, money, has exactly this feature: there is not a reaction but an action with a product: the credit. But

- a) the product themselves are the foundation for further credit operations,
- b) which are necessary because the interest (without which there would be no credit operations) creates the need for more money that is available,
- c) all of which creates risk which must be managed by further credit operations, the credit system is operationally closed.

Hence, the credit system appears to expand chaotically or “sprawls” in an autocatalytic way. But there is (cre-)order in the chaos, because of the interest to differentially accumulate by everybody involved.

Going back to capitalisation: the fact that earnings are denominated in money and usually paid in money, and that money is created through credit, means that credit operations and hence the property systems underlies capitalisation.

Accumulation, being a relative process, requires that earnings are greater than the average rate of return or average interest rate. As a consequence this reinforces an autocatalytic process of capital accumulation: since if there are some who beat the average there must be some who do not, by definition of the term average. This of course creates defaults if businesses run on credit and increases risk with the same consequences as above.

The processes of credit creations and differential accumulation are operationally closed: in order to counter a problem created by these operations other operations within the same logic performed without ever leaving the conceptual framework of capital accumulation.

6 Bureaucracy

In his “Hierarchy Model of Income Distribution” Blair Fix discusses how position in hierarchy can be translated into income: basically, income grows exponentially with position in hierarchy [17]. Bichler/Nitzan ([4] commenting an earlier paper of Fix, [16]) note that hierarchical organisation is always a power institution not just organisational convenience. In the following I will theorise that bureaucracy is *hierarchical organisation plus operational symbolism* and is the other mode of rational mastery (the former being capitalisation). Thus, Fix shows one kind of interaction of bureaucratic power and capital power, but there are others, and the direction goes the other way round too.

6.1 Bureaucratic capitalism

Standard definition of bureaucracy (Max Weber [36]): a hierarchically ordered organisation in which a higher level commands a level directly below by setting up usually generalised formal procedures and courses of action whose results are assessed by the same or other bureaucratic organisations. Each level is organised in departments with defined competences. Not only are almost all state organisations organised according to those principles, but also bigger corporations.

Theories of “bureaucratic capitalism” flourished in the 1950s and 60s. Castoriadis and the *Socialisme ou Barbarie* group developed theories of this type [1]. They are no longer in the focus of political theory despite the still common complaints about bureaucratisation [20].

6.2 The phases of global capitalisation

According to Bichler/Nitzan the process of the capitalisation of human societies from the late 19th century took place in phases [29]. In each of these phases the accumulation process would eventually hit an organisational barrier, or “envelope”. Through radical organisational re-formation (*Umgestaltung*) capitalism was able to “break” these envelopes and proceed further until the process hit the next barrier.

- a) The monopoly wave of the turn of the century occurred within individual industries;
 - b) the oligopoly wave of the 1920’s occurred within sectors;
 - c) the conglomerate wave of the 1960’s took place across the entire business sector at national level;
- and
- d) the wave of the 1980’s and 1990’s was, by and large, global.

We note that the first three “waves” took place within the legal and police framework of the nation states (the first two including their colonies). One could say that the bureaucratic state was a formation of capitalist formation activity (*Gestaltungstätigkeit*), hence “capitalist state” = “state of capital” [29].

In the Western states at the end of the 1960, that is when the theories of bureaucratic capitalism flourished, the situation looked like this: many big corporations were either directly “socialised” (e.g. automotive industry in France), operated like state institutions (e.g. aerospace: Pan Am as national carrier of USA), or there were tight arrangements on the national level by leading politicians, business and trade unionist leaders (“concerted action” in Germany). Many economic activities were traditionally state institutions (electricity, postal service, telecommunications, many had been private enterprises in the middle of the 19th century) and, as such, not the direct target of the accumulation process. The “*planification*” (French 5-year plans of the national administration) of those corporations was similar to those in the Soviet bloc (5-year plans etc.). And then there was the Eastern bloc of party-bureaucratic regimes (Soviet empire, China, etc). So we can say that the organisational mode of pretty much of the world, whether “capitalist” or “communist” was bureaucratic, hence the theories of bureaucratic capitalism seemed right.

I turned out, however, that it was not the case that with global bureaucratisation the differential accumulation process would cease to exist. On the contrary, the breakthrough of the national envelope from the 1970s of transnational capitalism created a new institutional formations and it became apparent that the accumulation process had never gone away.

The breakdown of the of the Soviet bloc and the transformation process in China may be understood as a (re-)capitalisation of their party-bureaucratic regimes either by transforming them directly into Western-style capitalist regimes (Eastern Europe) or by a capitalisation of the state bureaucracy (Russia, China).

Corporations and nation states are internally organised in a hierarchical fashion based on systems of rules, that is, they are “internally” (organisationally) bureaucratic regimes. The “environment” of these bureaucratic regimes, however, is differentially accumulating capitalism. The survival of a bureaucratic organisation (state, corporation) depends on its successful differential accumulation.

6.3 The autocatalytic sprawl of bureaucratic organisation

In the idealised Weberian world, bureaucratic rules are “rational” and set up by disinterested persons / organisations and are executed as written. In reality, everybody involved is interested in making a career, not to work too much etc. Bureaucratic institutions are pervaded with power struggles: managers of lower levels of the hierarchy try to rise and hence make informal arrangements, perform mobbing, withhold information etc. The subordinates either try to do the same or resist or try to keep out of the game. In any case, the activities are motivated by goals that are “irrational” from a “higher” perspective and are not a conceptual part of the bureaucratic schemes.

For its functioning, those who set up the bureaucratic rules require information about the processes to order. But those affected will hold back any information if it is in their interest. Either because information is power, or because too much information in superior levels of the organisation threatens the subordinates with e.g. higher workload, unwanted regulations and suchlike. Hence bureaucratic rules are made without the necessary information and are thus inadequate for its purpose which feeds back the irrationalities of the system into the system and increases them further.

Management sets goals for the subordinates. Management also sets the rules under which the subordinates should work. But the inadequacy of the rules force those who have to execute them continuously to work against them to “get things done,” i.e. to achieve the goals. But working against the rules shows disloyalty to the management. So there is a double-bind either the rules must be broken or the goals are not met. This inner contradiction of the bureaucratic regime further undermines its alleged rationality.

Occasionally, the irrationalities of the bureaucratic order are discovered by the management. The solution is then to set up new bodies for inquiries, surveillance etc. Since these bodies are necessarily also bureaucratic organisations (they have goals and “rationally” conceived rules), these attempts do no more than to further increase the dysfunctionality of the system. In the USA, after “9/11” it was discovered that the 13 secret service agencies did not cooperate properly, so another agency was created to coordinate the secret service activities. In the GDR, the ruling party had to create an entire bureaucratic “state security”, the *Stasi*, to make up for the lack of information about the goings on in society of the plan bureaucrats — the *Stasi* was the biggest such organisation relative to population so far.

We have observed that capitalisation is operationally closed: if problems occur, due to its own logic, the “solution” is more capitalisation. Similarly, if a problem occurs in a bureaucratic regime, new bureaucratic rules or new bureaucratic organisations are created by the bureaucracy to manage them. Thus, the bureaucratic logic is “operationally closed” in the above sense: bureaucracies create new bureaucracies. Furthermore, the irrationalities of bureaucracy create the *need* for the generation of new bureaucracies. Just as

finance, bureaucratic regimes are “autocatalytic,” they grow indefinitely by way of their own processing in a seemingly chaotic way, hence we observe an autocatalytic sprawl of bureaucratic organisation.

7 The interaction between bureaucracy and capitalisation

The intrinsic irrationalities of bureaucratic institutions are confined to some extent by the need for survival in differentially accumulating capitalism. So “internal rationality” of a bureaucratic organisation is a function of the “external rationality” of differential capital accumulation.

But we already saw that the autocatalytic sprawl of finance is a result of its inner contradictions which already turn its rationality into a pseudorationality. Furthermore capitalisation it is the “implementation” of power struggles by way of the syntactic machine of capitalisation. In order to defend financial capitalism as rational, power struggles would have to be defended as “rational”. The usual way to do this seems to be to say that power struggles belong to the “human nature.” So, capitalism is a “second nature” (Marx) but as such adequate for human beings. Such an argument, of course, ignores the fact that in addition to fighting each other all the time at the same time people cooperate all the time too. Indeed, if, within a business corporation, everybody would act as a capitalist towards each other (e.g. the secretary give out paper only against payment by the employee demanding it etc.) the corporation would immediately break down.

On any hierarchy level, information is a power tool in the career and hence not available to higher or lower order if possible (which undermines the rationality of the process). Contracts are signed with the limited information each of the contracting side has about the situation they are in. Thus, in both, bureaucracy and capitalisation intelligence, the collection of information relevant to the power struggle is a primary concern. Research is needed, but this might explain the enormous growth of the information sector and in particular, because all of this take place within the context of modern rationality, the computing technologies (big data, Google, and so on).

Fix shows how persons in bureaucratic hierarchies capitalise their position in the hierarchy [17]. This is, of course, is another motivation for the internal power struggles: making a career in such a hierarchy raises both management power and financial power. The ultimate turnover from hierarchical / bureaucratic to capital power may be seen in the “management buyout”, i.e. when topmanagers directly turn their accumulated position-relative top-income into ownership of the very organisation they already control by top-position within the bureaucratic power structure.

It would be interesting to investigate the relations of firms size in terms of number of employees, firm size in terms of capitalisation and number of hierarchical levels. Also: how did the size distribution (both ways) develop with time, i.e. is there a trend to bigger and bigger firms or not? One would think that bureaucratic hierarchies might grow too big and that eventually their inner contradictions work against their success in differential accumulations, so there should be a movement back and forth from mergers and acquisitions to outsourcing.

It would also be interesting to know if internal breadth = mergers and acquisitions [29] is the preferred mode of differential accumulation not only because it is the path of least resistance but also because it allows direct hierarchical control of the acquired organisation.

Occasionally, the idea comes up that the irrationalities of financial capitalism should be “regulated” either by new laws and prescriptions, or even socialisation. But this of course would just create new bureaucratic institutions. Proposals of the other way round also exist (particularly in the 1980s to 2000s): the irrationalities of state bureaucracy may be lessened by privatisation, i.e. by splitting up a larger state institution in smaller parts and sell them on the market as new business enterprises. Apart from the fact

that the inner regime of these new businesses will remain bureaucratic, they will now be directly subject to the irrationalities of differential accumulation (in addition, privatisation frequently creates the need for regulation of the new business field). The picture we get is a kind of pingpong game between the ever growing two forms of pseudorational pseudomastery over social organisation.

We get the picture that the capital and bureaucratic modes of pseudorational mastery can “overcome” their operational closedness by changing to the respective other mode, only to run into the irrationalities of that. Rational mastery, with its two modes capitalisation and bureaucracy is an endless agony which generates more of itself out of itself, hence the autocatalytic sprawl of pseudorational pseudomastery.

8 Systemic crisis or autocatalytic agony?

Bichler/Nitzan advance a theory of systemic crisis [5]. The thesis may be summarised thus: capitalisation is the discounting of expected future income. There are times in which indeed actual income trails its expectations by years. There are other times when actual income and expectations occur are nearly at the same time. Let us call the lag “temporal expectation horizon” or just “expectation horizon” (my term). A shrinking of the expectation horizon near zero destroys the machinery of capitalisation because there is no longer a kind of foreseeable future. This indicates a “systemic crisis.” Bichler/Nitzan perform an *aggregate* analysis to make their claims (while normally arguing against aggregate analysis).

Before we investigate the notion “systemic” in the light of the SIS concept of Castoriadis (which Bichler/Nitzan do not use), let us see if a shrinking time horizon is necessarily a sign of a *systemic* crisis. Suppose by way of “imagined reality” at a given time a particular capitalist regime consists of two “core capitals” A and B. Assume A is old and very big, B is new and small. The aggregate capitalisation of A and B will be dominated by A. Now, suppose the investors loose faith in the future of A-type business, perhaps because the profit margins are shrinking rapidly, while B-type businesses are celebrated as the new *hype* and have high profit rates. In such a case the expectation horizon of A will shrink to zero while that of B may still be several years. In the *aggregate*, because of the still dominant A, it will look like “all of capitalism” is in a crisis, i.e. that there is a systemic crisis, whereas a *disaggregate* analysis would show that a change in dominant capital is under way. Thus, an aggregate expectation horizon is not a sufficient criterion for systemic crisis.

The more fundamental questions here are: is the conceptual toolset of Capital As Power able to discover a truly systemic crisis? And what does the term “systemic” mean?

If we theorise capitalism with the conceptual framework of the double SIS of modernity, the autonomy project versus rational mastery, according to Castoriadis, the autonomy project is in decline since the 1950s (“rising tide of insignificance”, “world in fragments” etc. [7,8]), the movements of the late 1960s were only the last reappearance of this project. The world is more and more governed by the SIS of rational mastery, the autocatalytic sprawl of bureaucracy. To the latter we can add the equally autocatalytic growth of capitalisation. But there is a problem for the process of ever increasing rational mastery: during its entire history it was always challenged by the autonomy project. The dynamics of the Western socio-historic was driven by the antinomy of autonomy versus rational mastery. But with the autonomy SIS withering away the control project loses its “direction” so to say.

There may be another fundamental problem for the capitalist accumulation to continue. The transnationalisation of capital accumulation means that the accumulation process has left the institutional “bed” of the nation state. But the nation state institutions formed a framework or playground in which the accumulation process could take place. Further more, the nation state had a legitimacy: the imaginary of the nation, or nationalism. Nations are “imagined communities”, to take up Benedikt Andersons notion [2], a member of a nation, a citizen, can lead a meaningful life if it supports his *nation* (“right or wrong, my

country”). Nationalism, as an SIS, emerged in the 17th century and, at least in the 20th century, proved stronger than other imaginaries, in particular than the working class movement which can be understood as one “branch” of the autonomy project [10]. As Pohrt observes: in WWI the workers went to what for many of them became their “last struggle” (line in the International), but not against capitalism, but against their coworkers in the opposite trench, each in the name of their respective nation and for the respective capitalist elites [30].

For *transnational* capitalism, an equally strong collective SIS that can act as a legitimacy generator does not exist. There have been attempts to create transnational imagined communities. Perhaps the most ambitious project of this type is, or was the European Union. The “European identity” was supposed to eventually end in the creation of the “United States of Europe”. But the attempt to create a European constitution was voted down by the citizens of France, the Netherlands, and Ireland, countries that were supposedly strong supporters of the “European movement”. And now we have “Brexit” and the zombiesque resurgence of nationalist parties and ideologies. Other attempts to build up a system of transnational institutions are continuously marred by resistance, protests, etc. including calls to national authorities to take back what was already contracted (currently protests against CETA and TTIP, in the 2010s we saw “Occupy”, before that the series of G8 summit protests, in the 1990s action against “MIA”, etc.).

Finally, as far as the transnationalisation process goes, it necessarily undermines the organisational power of the nation states, i.e. the state bureaucracies. The result is an increasing number of “failed states”, a phenomenon which starts to reach the “capitalist center” (Greece, Mexico). A “failed state” could be defined as a formerly a bureaucratic entity which was no longer able survive the transnational accumulation process, and in which neither pseudorational bureaucracy nor finance rule, but anarchy and/or barbarism. (We may include wannabe such entities, e.g. in the case of South Sudan society went from “national liberation” to failed state without ever forming a functional nation state bureaucracy unless you count the previous regime of Sudan.) Thus, transnationalisation without a nation state replacement may well undermine its own foundation in the long run.

The situation should perhaps not be described, neither as “systemic” and nor as a “crisis”. In the Hippocratic sense, crisis would mean that the situation has reached a point of decision, *kairos*, when the patient either dies or recovers. The present, however, looks more like a steady decay: with the SIS of autonomy long in decline that of rational control may be also in decline due to its own success, and without a point of decision in sight.

If neither autonomy nor rational mastery are significant to people any longer, some seem to resort to nationalism or religion. But these SIS do not seem to be sustainable institution generators anymore either. Were religion or nationalism rules, we find corruption, gangsterism, or outright barbarism (ISIS).

All in all, there might well be a situation of decline of all imaginary significations that once generated social formations, i.e. not just the SIS of autonomy but also of rational mastery. But such a decline would be outside of the conceptual reach of a theory that is designed to analyse the generative processes of a particular SIS, such as Capital As Power is for the financial part of rational mastery.

9 Way out? Autonomy and operational symbolism

Is there a way out of the mess of the autocatalytic sprawl of pseudorational pseudomastery?

I have argued that operational symbolism is unavoidable in that previous symbolism failed. In addition modern science, properly understood, is part of the SIS of autonomy: it is the rejection of authority (God, holy books, tradition, etc.) when it comes to the question of what is actually the case. Instead, empirical

investigation and critique are the activities to advance human knowledge. Symbolic machines, the possibility to construct unlimited many provide a unparalleled liberty. And also, there are soon 10 billion people on Earth who need food, housing etc which cannot possibly be provided without application of technology = science-based technique.

Since modern rationality when combined with mastery yields autocatalytic agony, the “solution” may lie in a new attempt for autonomy which does not reject the “power” of modern science: rational autonomy. In sec. 3 we saw that *all* societies create the order of it (the nomos) themselves, the difference between heteronomy and autonomy was that in a heteronomous society its members think that the nomos comes from somewhere else and is essentially unchangeable whereas in an autonomous society its members take advantage of the selfcreation of the nomos which they consciously create. For a modern autonomous society to be truly democratic all of its members must have the same right to participate in that selfcreation.

By these standards, no fully autonomous society has ever existed. Yet according to Castoriadis there are two instances in human history when the imaginary of autonomy existed, the Athenian polis of antiquity (roughly 8th to 4th century BC) and in modernity (since the 12th century AD). In Athens it was limited by not including most of the population (women, slaves, foreigners) and by not including all social spheres (e.g. the *oikos* or private business, was not regulated by the polis); in modernity these limitations do no longer exist in principle, but instead it is the other imaginary of modernity, rational mastery, which limits and continuously cuts back the imaginary of autonomy to the point of making it almost vanishing (the “rising tide of insignificancy” [8]).

9.1 Inspirations from the Athenian polis

According to Castoriadis, there are enough questions raised by the Athenians and institutional solutions found which may still be relevant for a revival of the autonomy project. Athens is not a model, but a source or germ [9,12,13].

- a) Drawing office holders by the lot rather than electing them. Elections, the election of the “best” (*aristos*) is an aristocratic institutions [see now also . . . , Against Elections, 2016]. Drawing by the lot assume total equality of the selected.
- b) There was an extensive court system. Even decisions by the ecclesia (assembly of the citizens) could be brought before the courts and be rules illegal.
- c) There were institutions to warn against hubris, e.g. the Athenian theater.
- d) There were measures taken to prevent private interest to enter decisions about common matters. E.g. in decisions about peace or war, citizens with property close to the city’s walls were excluded.

9.2 Inspirations from CERN

Can we find organisations which can give us some inspiration (not a model!) in what direction to look for the combination of modern rationality and autonomy? I think the research “machine” CERN in Geneva may offer something here because it combined a relatively flat hierarchy and democratic decision making-process (at least according to the researches by Knorr-Cetina, [21,23]) with modern science i.e. modern rationality.

- a) There are few hierarchical levels and higher levels cannot give much orders to lowers: the machine is so complex that only a few persons will understand the particular work hence no one else can command them. (It is commonly assumed that a democracy proper must be simple enough so that

everybody can replace everyone. At CERN the opposite is true: they are equal because no one can replace the other because they do not understand (in detail) what they do.

- b) There is no assignment of authorship. Any publication of one of the collaborations bears the names of all members whether Nobel prize winner or apprentice. (Example: the announcement of the ATLAS collaboration of the discovery of the Higgs boson lists all 2932 members by name in alphabetical order [3].) The understanding is that the machine would not work without the contribution of any of them and that there is no way to tell, which contribution is more important than the other.
- c) Experiments like the ATLAS detector are the most complex machines ever created. It should be possible, therefore, to find inspiration there to organize the creation and maintenance of any other technical system (railway system, aircraft,...) in a relatively power free way since these will likely be technologically much *simpler*. The picture here would be a world in which all the technological infrastructure is socially organised into autonomous collaborations.

The idea is not to idealise CERN or any other organisation we may find for inspiration (Bichler/Nitzan cite the US Tennessee Valley Authority [4], one could also mention the free software movement, in particular its more radical branches who try to make reappropriation of their creations impossible via suitable license arrangements e.g. “copyleft” [18] and are consequently less popular with business than more “liberal” projects and licenses), indeed all of them operate in the context of rational mastery (capitalism and state bureaucracy) and its members were socialised in that. So a more thorough investigation of this will have to deal with the problems such organisations face and if these are intrinsic or the result of them being embedded in capitalism.

In a *collaboration* (or cooperative, to use the older term) people work together but otherwise live their private lives. More generally the question is how can all the people of the world (now 10 billion) *live* together in a global *convivum* or *cosmopolis*?

10 References

- [1] Jean Amair, Hugo Bell, Cornelius Castoriadis, S. Chatel, Claude Lefort, Jean-François Lyotard, Daniel Monthé, Panonicus, Paul Romano, Albert Véga, and Jack Weinberg. 2017. *A Socialisme ou Barbarie Anthology: Autonomy, Critique, Revolution in the Age of Bureaucratic Capitalism*. notbored.org, Brooklin NY. Retrieved from notbored.org
- [2] Benedict Anderson. 2006. *Imagined Communities: Reflections on the Origin and Spread of Nationalism*. Verso.
- [3] The ATLAS Collaboration. 2012. Observation of a new particle in the search for the Standard Model Higgs boson with the ATLAS detector at the LHC. *Physics Letters B* 716, 1: 1–29. <https://doi.org/10.1016/j.physletb.2012.08.020>
- [4] Shimshon Bichler and Jonathan Nitzan. 2017. Growing through Sabotage: Energizing Hierarchical Power. Retrieved May 7, 2018 from <http://bnarchives.yorku.ca/512/>
- [5] Shimshon Bichler and Jonathan Nitzan. 2018. With Their Back to the Future. *Working Papers on Capital as Power* 2018, 1. Retrieved from <http://bnarchives.yorku.ca/534/>
- [6] Cornelius Castoriadis. 1987. *The Imaginary Institution of Society*. The MIT Press, Cambridge MA.
- [7] Cornelius Castoriadis. 1997. *World in Fragments: Writings on Politics, Society, Psychoanalysis, and the Imagination*. Stanford University Press, Stanford CA.
- [8] Cornelius Castoriadis. 2003. *The Rising Tide of Insignificance (The Big Sleep)*. Notbored.org, Brooklin

NY. Retrieved January 5, 2010 from <http://www.notbored.org/RTI.pdf>

[9] Cornelius Castoriadis. 1991 (1982). The Greek Polis and the Creation of Democracy. In *Philosophy, Politics, Autonomy*. Oxford University Press, New York, 81–123.

[10] Cornelius Castoriadis. 1993 (1976). The Question of the History of The Workers' Movement. In *Political and Social Writings*. University of Minnesota Press, Minneapolis, 157–206.

[11] Cornelius Castoriadis. 1997 (1989). Done and To Be Done. In *The Castoriadis Reader*. Blackwell, Oxford, 361–417. Retrieved from <https://becomingpoor.files.wordpress.com/2016/02/the-castoriadis-reader.pdf>

[12] Cornelius Castoriadis. 1997 (1991). The Greek and the Modern Political Imaginary. In *World in Fragments*. Stanford University Press, Stanford CA, 84–107.

[13] Cornelius Castoriadis. 2003 (1993). The Athenian Democracy: False and True Questions. In *The Rising Tide of Insignificance (The Big Sleep)*. Notbored.org, Brooklyn NY, 311–328. Retrieved from <http://www.notbored.org/RTI.pdf>

[14] Carl von Clausewitz. 1943. *On war*. Modern Library, New York.

[15] Johannes Gerard van Dillen. 1934. *History of the principal public banks accompanied by extensive bibliographies of the history of banking and credit in eleven European countries*. Mouton, The Hague.

[16] Blair Fix. 2017. Energy and institution size. *PLOS ONE* 12, 2. <https://doi.org/10.1371/journal.pone.0171823>

[17] Blair Fix. 2018. A Hierarchy Model of Income Distribution. *Working Papers on Capital as Power* 2018, 2. Retrieved from <http://bnarchives.yorku.ca/540/>

[18] Free Software Foundation. 2007. GNU General Public License Version 3. Retrieved May 11, 2018 from <https://www.gnu.org/licenses/gpl-3.0.en.html>

[19] David Graeber. 2014. *Debt: the first 5,000 years*. Melville House, Brooklyn, NY.

[20] David Graeber. 2016. *The utopia of rules: on technology, stupidity, and the secret joys of bureaucracy*. Melville House, Brooklyn NY.

[21] Johann Grolle. 2008. Ein Urknall auf Erden. *Spiegel* 2008, 27: 102–113. Retrieved from http://hep.ph.liv.ac.uk/%7Emklein/lhcPR/Spiegel_37_08_Ein_Urknall_auf_Erden.pdf

[22] Gunnar Heinsohn and Otto Steiger. 2009. *Eigentum, Zins und Geld: Ungelöste Rätsel der Wirtschaftswissenschaft*. Metropolis, Marburg.

[23] Karin Knorr Cetina. 1999. *Epistemic Cultures: How the Sciences Make Knowledge*. Harvard Univ Press, Cambridge MA.

[24] Gerhard Köbler. 2014. *Indogermanisches Woerterbuch*. Innsbruck. Retrieved September 13, 2016 from <http://www.koeblergerhard.de/idgwbhin.html>

[25] Sybille Krämer. 1988. *Symbolische Maschinen. Die Idee der Formalisierung in geschichtlichem Abriss*. Wissenschaftliche Buchgesellschaft, Darmstadt.

[26] Sybille Krämer. 1991. *Berechenbare Vernunft: Kalkül und Rationalismus im 17. Jahrhundert*. de Gruyter, Berlin.

[27] Legifrance. 2018. *Code civil*. Retrieved April 19, 2018 from <https://www.legifrance.gouv.fr/affichCode.do?cidTexte=LEGITEXT000006070721>

[28] Donald MacKenzie. 2008. *An Engine, Not a Camera: How Financial Models Shape Markets*. MIT Press,

Cambridge MA.

[29] Jonathan Nitzan and Shimshon Bichler. 2009. *Capital as Power: A Study of Order and Creorder*. Routledge, New York and London. Retrieved from bnarchives.yorku.ca/259/

[30] Wolfgang Pohrt. 2012. *Kapitalismus forever: über Krise, Krieg, Revolution, Evolution, Christentum und Islam*. Edition Tiamat, Berlin.

[31] Arno Ros. 1989. *Begründung und Begriff: Wandlungen des Verständnisses begrifflicher Argumentationen*. Meiner, Hamburg.

[32] Hans-Joachim Stadermann. 2006. *Nominalökonomik*. Mohr Siebek, Tübingen.

[33] Otto Steiger and Hans-Joachim Stadermann. 2001. *Schulökonomik*. Mohr Siebek, Tübingen.

[34] Peter Suchsland. 1968. *Deutsche Volksbücher*. Aufbau, Berlin und Weimar.

[35] Ernst Tugendhat. 1982. *Traditional and analytical philosophy: lectures on the philosophy of language*. Cambridge University Press, Cambridge UK; New York.

[36] Max Weber. 2013. *Economy and society*. University of California Press, Berkeley CA.

[37] Ludwig Wittgenstein. 1958. *Philosophical investigations*. Blackwell, Oxford.

[38] Wörterbuchnetz. 2011. Deutsches Wörterbuch von Jacob Grimm und Wilhelm Grimm. Retrieved September 13, 2016 from

<http://woerterbuchnetz.de/DWB/?sigle=DWB&mode=Vernetzung&lemid=GV02805#XGV02805>

[39] 2014. Eigentum. *Rechtslexikon*. Retrieved May 12, 2018 from

<http://www.rechtslexikon.net/d/eigentum/eigentum.htm>

[40] 2018. Eigentum. *jura-basic*. Retrieved May 12, 2018 from <http://kauf.jura-basic.de/>

[41] 2018. Autocatalysis. *Wikipedia*. Retrieved May 12, 2018 from

<https://en.wikipedia.org/w/index.php?title=Autocatalysis&oldid=840644428>