IntroV5 March 27, 2020
By Joost Kircz

Socialist strategies and the role science

What is this work about, and why is it long and has so many digressions in appendices, boxes and footnotes? Why not just saying: it is about changing the world instead of interpreting. An old and beloved reference to Karl Marx's short theses on the German philosopher Ludwig Feuerbach (1802-1872), probably written in Brussels April 1845.[1] Because his short concluding thesis # 11: "The philosophers have only *interpreted* the world in various ways; the point is to *change* it", is only a simple battle cry for socialist action. However, this battle cry, as all battle cries, demands more flesh on the bones,. Fighting for a better world, for the abolition of the suppression of one human being by another, irrespectively of differences in biological make-up, or "save the planet"; all these are shorthand battle cries to counter deep problems of the present state of humankind as part of nature. Marx was right, it is not only about interpretation, that is to say, to try and explain where we are and how we arrived at this temporal place. The issue is: where do we go as human society. The goal of our exercise is to steer the world into a new direction, hence, to change the world, based on the best knowledge of the present and our understanding of its dynamics.

But what direction could be the best for humankind, based on an understanding of the how and why we came here and develop as social species? This understanding of where we are and how we came here is intertwined with our possibilities to envision a future, we consider "better". We can interpret phenomena and experiences only if they are represented in a certain mental model. Otherwise we remain on the level of reflexes. Below, we introduce a series of notions which might help as guiding rails in our investigations.

Models

A central issue is the notions of **models**. We frame our sensual impressions and thoughts into a model, some kind of 'picture' or 'intuition' which enables us to try and understand what we experience and act within that framework. Hence, a model is a dynamical representation of our physical experiences and thoughts. This can be recurring physical reflections, but also mental reflections, expressed in our individual mental framework, which is the result of education, religion, social and political environment, etc. and this all together, often named world view (Weltanschauung). Within such a model, we operate in our social daily life. Most often these models are different for different situations, e.g. our understanding of the political environment, and our limited knowledge of how our mobile phone works and how to operate it. A crucial tenet is that models, as we use them, are metaphors. If we pretend to understand something, e.g. the structure of our planetary system as we learned on school, we can fairly easily use this as metaphor in others situations, such as the Sun King surrounded by its subordinates, or the Bohr

[1] MECW v.5, Lawrence & Wishart 2010, p. 5.

model of the atom as a nucleus surrounded by electrons. Metaphors we live by, as Lakoff and Johnson[2] explicate in their studies. We expand this point in the project.

Theory

In order to go beyond these type of 'pictural' understanding of phenomena and thoughts we develop theories, standardized and codified structures that aim to make encompassing descriptions within a certain field that 'safes the phenomena' as well as reflect the dynamics in that field including the prognoses of it development. For instance, the theory of capitalist accumulations is a tool for developing rules and regulations to foster its societal positions, as well as a tool to criticise it and suggest alternatives for the economy. The theory a General Relativity gives us an understanding of gravity beyond the simple earthly experiences of falling bricks. Immediately we see an interesting aspect popping up. In the last example, the theory surpasses the previous Newtonian theory of gravity, but also incorporate its results and allows, in specific cases, its conflation. The situation in the first example is distinctly different. A new economic theory based on a democratic plan economy will be at odds with the present hegemonic economics theories and they will certainly never conflate. Even if certain notions overlap.

This type of considerations forces us to understand the various kinds of theories and their mutual relationships and structures. For that reason a large chunk of the present work will deal with natural sciences, because their theory formation is still relatively simple. We deal with 'non-thinking' materials. In really complicated situations where the objects of investigation, such as humans and human relations, things become more complicated, we don't have yet such precise theories and the open question is: how far can we approximate social dynamics with coherent theories. It is for that reason that people try and restructure theories, successful in te natural sciences, to import in social theories. One of the best examples is the 'rational choice theory' in economics, that starts with pertinent assumptions about the drives and actions of the individual members of society and so by equalizing the great number of human players to a collection of look-alike objects. The lessons from thermodynamics and statistics are applied in a search for operational conclusions[3]. It goes without saying that in all investigations we have to start with so-called toy models, simplified models that hopefully allow for some formal, mathematical, representation that enables us not only to describe but also to forecast. In the case of neoclassical economy, the breakdown of the highly popular rational choice theory is exemplified by the The Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel to Daniel Kahneman (2002): "for having integrated insights from psychological research into economic science, especially concerning human judgment and decision-making under uncertainty": and Richard H. Thaler (2017): "for his contributions to behavioural economics". Indeed people are human and not atoms. After decades of belief, foundering primitive rational choice theory is heralded as a major accomplishment.

---

[2] George Lakoff and Mark Johnson, *Metaphors we live by*, Univ. Chicago Press, 1980.

[3] Philip Mirowski, *More Heat than Light, Economics as social physics, physics as nature's economics*, Cambridge UP, 1989.

Names and notions

A model and a theory deal with notions, like movement and explosion, and names, like apple, labour power, and electron. A name is a word that identifies an object or an activity. A special human invention in this context, apart from e.g., verbs and nouns is the formal grammars of mathematics and logic, in which we deal with pure abstract signs that contrary to a noun such as apple doesn't need an intuitive understanding (Anschaulichkeit in German). A sign just is. A denotation of an abstract notion, which can have a name, such as Ψ (psy) for wave-function in quantum mechanics, or 3 (three) for the notion of a collection of 3 objects, or the third object in counting some objects. However, the task is a) to transcend the name humans give to an object or activity, the falling apple, to a well-defined notion that allows to be equated to a sign and therewith enable to entre the abstract heaven of mathematics, and b) given an abstract mathematical sign structure, to project back to real life notions. Obviously, the to and fro from object to sign and back is never a homomorphism and here starts the discussion on Plato's cave. In social practice we pragmatically pick words and relationships and in many cases it turns out to be sufficient within a context. We don't know why quantum mechanics "works" and what exactly "ripples in space-time" mean, but the GPS in our lorries work and is most helpful in optimising logistics, trade, and commercial profits.

As we are not dealing with 'rocket science' , which despite the beauty of its metaphor is not so much as science as a well-grounded part of engineering, in this study we try to dig deeper into the role and necessity of models and theories and their laws in order to use our understanding for social change. In this endeavour we come across many obstacles. One is the emergence of models in it historical social context, a second is the (conscious or unconscious) contingency of the model and therefor the limitations of its reach, and the third related quest is the applicability of a model or theory between fields of investigation.

As in modelling and theory formation, the natural sciences are easier as there we are able (we presume) to think in terms of well-defined elementary entities and their interactions, we spend considerable time to explain the intrinsic problems in those fields. Given the tremendous successes of the natural sciences, which define nowadays our social environment, it is not unreasonable to assume that social sciences and humanities try and develop their own models and theories based on the examples next door. However, the essential question is, to what extent is this allowed and given the lead taken up by the natural sciences, are we able to develop models and theories that go beyond them and are better applicable to human social reality as part of nature. This question was certainly an issue Marx and Engels considered in their attempts to work out a scientific socialism as answer to all kinds of romantic day dreams about socialism.

Our understanding, about knowing how we arrived here as humanity, has to be based on a worked out theory. Subsequently, we can consciously develop society further in a certain direction. Keeping in mind, that our model or theory is a historically developed construct that will change (or fine-tuned) as the result of accruing an ever increasing amount of data and understanding in the development of human culture.

Based on the understanding of the contingency of our knowledge and the historical contextuallity of our present human existence, we have to carve paths that lead to social change. This includes an understanding of the intrinsic dangers and potentialities of certain political trajectories. One of Lenin's pet sayings was "*A la guerre, comme a la guerre*", and indeed in a situation of war, where the rules are dictated by the enemy, it is difficult to keep an open discussion whilst in the tranches. Nevertheless an emancipatory theory must, reflectively, include her own threats and strengths in our pre-emancipated environment.

Levels of understanding

This brings us to the first question: are we able to envision theories that to a certain extent can be seen as coherent models: projections or mappings, of real experiences onto a mental understanding. This ranges from e.g. a falling stone that we understand in terms of gravitation or a mental disorder which we try to map on certain hormone levels in the brain or bloodstream. In both cases we develop a model that, we hope, can not only faithfully -that is we believe that it describes the phenomenon correctly- tells us why we are here, but also forecast where we are going. On this level it is an open question to what extent we reach causal theories or only statistical or probabilistic theories. In a metaphorical way, we can compare models and theories that e.g. notion 'work' in the fields of non-living matter, with social models of how societies develop, which might give us handles for active social intervention. In first order, we have no reason yet to believe that models or theories in field 1 have the same structure as in field 2; such as mechanical engineering models and human behavioural expressions. This despite many attempts in that direction, such as in stimulus-response theories and behaviourism.
Though, as we only have one world, there is always a challenge to try and seek commonalities between two fields which, after all, are expressions of the same world. This notion induces the quest for universal understandings or deep fundamental laws, which is illustrated with the frivolous use of notions as energy or entropy in non-physics fields[4]. In all cases, this often inappropriate usage of well-defined terms serves as metaphor.

A mentally or socially internalised model will subsequently interfere with the process we encounter; make use of it, stop it, or reverse it. A model is not an ideal "something out there" (the "out there" *an sich*), but a way of expressing and applying current knowledge and understanding. Some models remain fresh for centuries or even millennia (e.g. the monarch is sent by God), others are short living. But nevertheless, in all cases they play an important role in sharpening our understanding.

[4] Here we can see the difference between a metaphor or model and full-fledged theory. In thermodynamics and statistical mechanics, the notion entropy can be sharply defined. Here we equate entropy with a measure of order. This does not mean that we are free to simply say that the entropy of my bookshelves is larger than that of the public library. Using the word entropy as a metaphor for disorder is a most useful speech act, but can only get serious meaning if we are able to "model", in this example, books as identical objects, ignoring their differences. Or, to give the earlier example: taking consumers as identical objects in rational choice theory.

Note, that there is always a tendency to represent material entities with short-hand signs. Whilst material objects can be described by a manifold of different indicators (characteristics, denotations, attributes, or properties), a sign can be defined unambiguously.[5]

This is the force of logic and mathematics. We can manipulate signs according to unambiguously defined rules, and in doing so, we can reach "logical" conclusions. The beauty of, in particular, natural sciences, is that we strip the material object to a limited number of well-defined (physical) notions (e.g.: its length, or electric charge), and by defining rules and laws dealing with these notions, we can not only faithfully "picture" our experiences, but even forecast real world material phenomena. This tremendous successful approach is for many a philosopher or natural scientist a reason to take clean abstract models more serious than dirty matter. Obviously, such ideas leave plenty room for any kind of deity in cases of trouble, such as life and death or falling in love, which in the next turn equates God with e.g. a geometer or as The Great Architect.
This problem of theory building and the notion of scientific realism is taken up in further work.

In that chapter of our study we deal with the notion of: to what extent can we denominate a natural/biological process, giving it an understandable encompassing reference name, that function in a model or even theory.
Are such denotations only a 'language game' within a certain social context or is it an efficient and effective working hypothesis "for all practical purposes FAPP" to use an expression of the famous theoretician of quantum mechanics John Bell (1928-1990)[6]: a historically developed, temporal, understanding; the best we can drum up now.

Or much stronger: is a model only a pragmatic way of expression as far as we can go, as the pragmatists since William James and Ernst Mach's "economy of thinking" suggest?[7]

Whilst on the other end in the opposite direction, we can think that we are asymptotically approaching the "real" thing in and for itself, as Immanuel Kant suggests us?[8]

A very interesting approach to this problem is Albert Einstein's idea to split theories into two kinds. On the one hand constructive theories, that are build up from experiences and on the other hand principle theories that are build up from (reasonable) pure ideas and whose results can subsequently be confronted with experiments. His Special Theory of Relativity is the prime

---

[5] Obviously, a brick can also be named by a sign e.g. its product number, but then we don't talk any more about the brick but only of its incarnation as commodity.
[6] John Bell, Against 'measurement', *Physics World*, August 1990, pp.33- 40.
[7] William James, *Pragmatism and four essays from the meaning of truth*, Meridian, New American Library, 1974.
[8] Immanuel Kant (1781 and 1787), Critique of Pure Reason, Paul Guyer and Allen W. Wood (trans. and eds.) Cambridge University Press, 1998.

example of a theory based only 2 principles and resulting in a complete overhaul of modern physics. Einstein originally developed this idea in a popular article in *The London Times*.[9]
I will deal with this 'dialectics' between the two types of theory in further works
Or, and this is our quest, do we deal with, a dynamics between observations/ experiences and ever changing modelling. In other words is the "real" thing a chimera and can we better understand it as a morphing of "something out their": a material world, of which we humans are products and part as well, and our best possible descriptive, ever changing, models.

The next, lower, level is a better understanding of the process of knowing. For still unclear reasons the human brain is able to 'picture' experiences, remember them and subsequently store them in a plurality of often overlapping models that, more or less, are fair representations of our experiences and enable us to forecast -and this is essential- further devolvement. Interestingly these mental "pictures" can be a kind of visual analogue forms, as well as in represented in linguistic grammatical form, including formal grammars such as mathematical models and logic (cf. the distinction between old Greek geometry and modern algebra). Modern biological sciences declare the neurons of the brain as the seat of memory and thinking. Although, we don't know how this neurological complexion (is it a wild garden or a mechanical engine) works? We can measure ("see" with the aid of electric pulses) brain activity and can locate brain damage.[10]
Neurology is nowadays the playground for formal computational models. This development is so fast and promising that in normal speech we witness a to and fro of metaphors between computer science and neurology. Formal computational models, which are -most of the time build-up as modular structures, with or without "artificial intelligence" approaches, find their ways in modelling the brain and our thinking[11]. A big enigma for this type of thinking is the possibility of a distributed, semi-autonomous, brain such as the neural hub around our guts and the erstwhile suggestion that stegosaurs might be endowed with a second brain, given the long time a signal needs to reach from head to tail. Evolutionary, the distributed neural structure of the Octopus, which her eight arms that operate (semi?) independently, suggest a different type of modularity.[12]

A further step down to the basements of our behaviour, we are confronted with (at least) two intertwined threads. On the one hand we see regularities and try to phrase them in so-called laws, based on well-defined notions, e.g. Newton's three laws of mechanics.[13]

---

[9] Einstein 1919, What is the Theory of Relativity, *The London Times*, November 28, 1909. Reprinted in: *Ideas and Opinions by Albert Einstein*, Bonanza Books, 1954.
[10] E.g. the works of Olivier Sacks.
[11] From the posthumous start of John von Neumann (1903-1957), *The computer and the brain*, Yale UP, 1958, to e.g. Jerry A. Fodor's famous *The modularity of Mind* , MITpress, 1983 to a great many investigations today in computational neuroscience.
[12] Peter Godfrey-Smith, *Other Minds; The Octopus, the sea, and the deep origins of consciousness*, Farrar, Strauss and Giroux, 2016.
[13] 1st law) defines the notion of an inertial frame, that is to say: an object either remains at rest or continues to move at a constant velocity, unless acted upon by a force. This is what we experience every day. 2nd law) The co-defining of force, mass and acceleration as force is mass times accelerations a given: F=MA. 3rd law) The notion that action induces an equally strong reaction.

On the other hand we have to understand how the various well-defined notions, which serve as the building blocks of our theories (mass, velocity, labour force, surplus value, etc.…) are results of prior modelling and, hence, historically contingent. A simple example is the notion of atoms, which started out as being indivisible smallest building bricks of nature and in modern terms are only more or less metaphors except in the definition of the smallest entity of a chemical element. In the endless play between empirical data and theories, we can consider an established theory as a reference frame or even bench-mark. Under normal circumstances empirical data have to fit the theory, which must be able to suggest novel, measurable, data. But if empirical evidence wrings with the theory, because –for instance- we need too many adjustable parameters, we have to consider adopting a novel theory that incorporates the old and new findings, with the danger that fundamental notions of this new theory are not supported by the old one.

.

The notion of the atom as an example. An excellent example of changing perceptions of a term is the notion Atom. In the ancient Greek world, it was considered as the smallest part of matter. For a long period, the atomists discussed the form or constitution of these most elementary units of matter (stuff). With the chemical revolution, the notion of an atom changed to the notion of the smallest possible entity of a chemical element. However, in due course this smallest entity was split up into an electrically positive nucleus with negative electrons circling around it. This nucleus is further split into protons and neutrons. As a single chemical element is presently defined by the number of protons whilst the number of neutrons can vary, we have various versions of the same chemical element: so called isotopes. Now the proton and the neutron are considered to be mixed bags of quarks of which we now know quite a number. However, the electron remains a fundamental entity (a traditional atom). But even worse, the unity of an elementary chemical atom as a particle is broken. In quantum mechanical language, the atom behaves as a wave, and, indeed, we can do interference experiments with atoms where they, like light waves, interfere. We can also add energy to the outer electrons of an atom, so that they "excite" to a high (Rydberg) orbital and the size swells to that of a small bacterium, which makes the notion of small ambiguous. Given this fact, we then have to ponder the empty space between the electron orbitals and the nucleus and wonder why this emptiness in terms of matter per volume is way less than that of the cosmos. Nevertheless, in normal speech, the atom is the metaphor for the smallest of something. Just as DNA is now a measure of the uniqueness of, e.g., a consultancy firm for mortgages. Nothing wrong with metaphors but in developing a novel Marxist world view, we have to be careful to be clear about what we mean, want, and try to develop.
Quote from: *Joost Kircz 2015, Reality, knowledge and forecasting.* Essay based on my presentation at the conference: Le troisième âge du capitalisme, sa physionomie socio-politique à l'orée du XXIe siècle. En mémoire d'Ernest Mandel (1923-1995), May, 20-22, 2015, Lausanne, Switzerland.

English version, as IIRE Working paper 41, 27 pages.
http://fileserver.iire.org/working_papers/WP41.pdf

Ultimately we reach the lowest level, which many people consider the highest level

The order here suggested has a good reason because, traditionally, we think in terms of ever digging deeper down in order to reach ultimate laws or truisms (and the philosopher's stone), which in ever more complex interactions give rise to human culture as pinnacle of the creation. This evolutionary thinking from primitive to complex might be a correct model for describing our environment as far as we can manipulate it, but is not the way to invent our theories. Indeed, by hunting and gathering data we might find regularities inductively, and inductive sciences are the bread and butter of our understanding. But the reverse mode is the way we conventionalise our existence and knowledge. We live, work, and dream in social contexts, of which our experiencing is indeed based on inductive knowledge. It is in that context that we struggle to build and understand ever more encompassing theories and models. Novel models, made that way, introduce new ways of thinking and metaphorical mapping, that on its turn changes our outlook. The change over from e.g. an earthcentric planetary system to a heliocentric model took a long time, not because the facts "told us so", but because the whole culture of humans as God's creations as central in the universe was shattered. The same way the idea of natural constants, such as the velocity of light in vacuum being the same in all (internal) situations, introduced a revolution in physics and astronomy without which the whole idea of gravitational waves was not conceptualised and certainly not searched after, and recently even found.
The quest then boils down to: under what circumstance are we socially/culturally able to allow novel ideas and subsequently, how these novel ideas, if proven useful, change our world outlook and consequently our theories. This is not a hopping between language games, but here words and grammar are becoming real objects, I think in the way Evald Ilyenkov tries to attack the problem.[14] An important caveat here is to invert a successful theory to the an essential and fundamental truism. This process is e.g. visible in the Stalinist deviation of Marxism. The novel 19th century idea of a dialectical materialism in opposition to idealistic reasoning, in particular to the dialectics of Georg Wilhelm Friedrich Hegel (1770-1831), became a gauge for all scientific activities, therewith moulding scientific ideas into the straight jacket of formalised "diamat", without a dynamic development of the dialectical materialistic notions, nor, and even more importantly, be able to reach superior forecasting of new developments.

This is also the essence of the approach M&E entertained. Under what conditions could a capitalist mode of production emerge and after its social implementation could we better

[14] Evald V. Ilyenkov, *Dialectics of the Ideal*, In: Alex Levant and Vesa Oittinen (eds), *Dialectics of the ideal, Evald Ilyenkov and creative soviet Marxism.* Brill and Haymarket Books, 2014.

understand its powers, weaknesses, as well as internal dynamics, as part and result of the very system? By knowing that, it becomes a human political, social, activity to defend the system or to fight it. Hence, in that sense it is not about interpreting the capitalist mode of production but understanding its dynamics in the best possible analytical way. The same way, in a more simple form as we understand the interpenetrating forces of a chemical reaction and can make use of it by tampering with them in order to steer chemical reactions and create new types of molecules. We must become able to understand the various mutually intertwined forces in an economy to enable change and overcoming into a next stage. In very concrete terms this is linked to the so-called idea of transitional demands. We start at the given situation and create an -in this case political force- that fits the 'logic' of the system but drives it in a particular direction.

> So, the slogan for an honest wage is certainly lofty but it remains romantic as long as the notion of honesty is not shared by all people on earth. On the other hand the notion of a sliding hour scale, that is to say a division of labour among the potential labour force instead of one part of the working class that works insanely and an-other part that is paid miserably by tax monies (which are in the last analysis extended wage of those who work) is concrete and understandable. In "honest" economy it is "fair" that everybody works creatively and wealth is divided among all people. So, Marx's conclusion that the political fight is about the distribution of the surplus value created in production, is based on an understanding of the dynamics of the capitalist mode of production as a social system and not based on interpretations of the miserable and dreadful consequences of this economic system.

In short: we develop models and theories based on induction, after which we –for all practical purposes - we equate the theory with truth and benchmark for new findings. But at the same time, we envision –based on ever increasing experiences- new vistas and new notions (such as labour power). It is in that discourse that we formulate new ideas, which demand not an extension of the hegemonic given, but novel skeletons and grammars.

This brings us the last issue of our investigations. If we are able to understand why and how we arrived here where we are; to what extent are we able to steer a future. In other words what is in store for us, given where we are? Also here, we see metaphorical lines with natural sciences. Only, if we believe that dynamical systems are purely mechanical than we must accept that the future is pre-established. However, for already more than a century we know that even in mechanical dynamical systems, small changes in initial values can give rise to widely different results. In technical terms this is called chaos, or butterfly effect, which is distinctly different form the notion of randomness. But this is only one aspect. In many-body systems, that is to say not in idealised simple systems, but in almost every situation, we are confronted with choices. In Darwinism this is formulated in terms of environmentally induced evolution that gives rise to the plurality of species. In chemistry we deal with thermodynamics, and in standard quantum

mechanics we are confronted with the notion of entanglement which can be seen as being close to the notions of statistical mechanics, where averages and probabilistic change are as far as we can go.
In other words, the old notion of a plenum of possibilities and great varieties of potentialities is part of our search for conscious change, based on -indeed socio-historically- developed theories of knowledge as well as the socio-historical created present we are living in. The choices, based on the local circumstances, made that modern capitalism was created in Western Europe and not in China, and that this fact drove the whole planet into a capitalist phase, a fact Marx and Engels emphasized. Knowing how we arrived here is a good starting point, but it must not remain contemplation with our back to the future, as a lot of historians and many sociologists (e.g. of science) seem to entertain. It must reveal the various forces, tendencies and contingencies that will enable to forecast that is to say; make history a pillar of a conscious future. In evolutionary terms we must understand how in a plurality of possible choices, we will be able to make that step forward that allows for the maximal choices in the next steps. We can never step back in history, except by forcing the planet to start evolution again by self-destruction. The driving force of the capitalist mode of production that only knows profit maximising, is a good example where a conscious or unconscious direction looks more a runaway train than a humanistic society.