High Priests of Telescopes and Cyclotrons

Marxism and Revolutionary Strategy as Science

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"Having set out to change the world, rather than produce one more interpretation of it, Marxist theory must ultimately be weighed on the scales of history."[1]

Within my lifetime as a political radical I have seen the Occupy movement collapse under its own incoherence, revolutionary aspirations dampened by subsumption into bourgeois party politics (Corbynism was my experience, though across the Global North many variations of this theme were evident), and now a return to the demands for a revolutionary party. When you are in the midst of these moments it is difficult to look beyond them. We are bombarded by those who speak with the surety of science about what the strategy must look like, and yet when movements collapse the only explanation is the betrayal made by those in power.

Because I am a practicing scientist and someone who follows in the Marxian tradition, the notion of Marxism as science - indeed scientific socialism - has been a point of both interest and conflict for me. What does it mean to attempt to evaluate - and ultimately accept or reject - a revolutionary strategy? There are a number of obstacles preventing a generative dialogue where these subjects are concerned, mostly centering around definitions. What is science? What do we mean by strategy? What do we mean by socialism? Putting the - by no means insignificant - question of socialism to one side, I want to think through the relation between strategy and science in an accessible manner. As such the whistle-stop tours through one lineage of philosophy of science, of classical Marxism, and definitions of strategy are by no means comprehensive, and nor are they intended to be. Indeed, the examination of Marxism's claim to being a science has been undertaken many times and by critics as diverse as Karl Popper and Michael Burawoy. Here I would like to provide an accessible grasp of these debates around what science is and the evaluation of the claim that Marxism is a science, moving these discussions more concretely toward strategy, providing a framework from which to think through the interrelation of Marxism, science and strategy. Finally I would like to think about what the jumping off point is for revolutionary

theory that does not simply emerge from the bottlenecks of the past.

What is science?

Such a simple question has challenged philosophers for centuries now. By contrast, most scientists don't think much about it at all, they simply do it. But what do they do that is distinct from any other mode of investigation? The usual starting point - whose first articulation is generally credited to Francis Bacon - is inductivism, the idea that accumulated observations of nature can be generalised into natural laws. Though induction remains a central part of science in practice today, many called into question the predictive power of inductive logic. Having observed the sun rising every morning we can generalise a theory, and therefore predict that the sun will rise again tomorrow. However, we cannot rationally justify this - uniformity in nature cannot be demonstrated based on an accumulation of observations. After all, irregular events do occur. This problem - referred to as Hume's problem of induction, despite having been highlighted as early as the 2nd century AD by Sextus Empiricus - forms the rational kernel of Popperian falsification. Karl Popper - renowned anti-communist and Vienna Circle member - showed that inductive logic sees science in purely probabilistic terms. Inductive logic bases the demarcation of science and non-science rests on the probability of any theory. If the mathematical probability of a theory is high, then it qualifies as science; if it is low then it is not scientific. Taking the problem of inductivism to its logical extreme, Karl Popper argued that we can never prove any theory (i.e. the probability of any theory is close to zero). Instead he argued for falsification as the true demarcation criterion between science and non-science. Any theory is scientific if an experiment is proposed that can falsify it. Furthermore, falsification is all we can hope to achieve. A theory can never be proven, it can only be falsified and therefore rejected. Here science proceeds through the refutation of theories. Though this appears to be a useful common sense definition of science at first blush, the result is a science that is dehistoricised and abstracted from its practice. We all - not just scientists - use scientific laws to anticipate the future and engage with the world around us. Moreover, theories are not just junked once disproven. Often additional hypotheses are generated to explain the anomalous results.

It is clear that both induction and falsification must have some role in science, though neither alone can demarcate the category of science from non-scientific investigation in a manner that satisfactorily explains the practical workings of science. A number of considerably more sophisticated definitions of science have been proposed. I will briefly describe two of these. The first is the Kuhnian paradigm shift. Unlike Popper, Thomas Kuhn was a practicing scientist, trained in physics. His The Structure of Scientific Revolutions is one of the most influential philosophy of science texts within the scientific community itself. Kuhn conceived of science as comprised of the process of "normal science" followed by revolutionary breakthroughs in a series of punctuated equilibria. The period of normal science involves the quantitative build up of evidence that refutes a theory. This is the day to day practice of the scientist: diligent research attempting to corroborate and quantitatively put flesh on the bones of the overarching paradigm. The paradigm itself is simply a scientific theory together with an example of its successful application that is sufficiently convincing that other scientists commit to dedicating their careers to it. This suggests that there is no hard quantitative evaluation of whether a new paradigm is taken up. The paradigm shift is not a purely data-driven process, because data is perceived through the lens of the currently dominant paradigm. There are no simultaneously active competing research programmes and falsification is rejected. Instead, the paradigm shift is a predominantly social process, with scientific revolution cast as an irrational change. There is no absolute measure of how progressive your theory is, there is only the value placed on it by the scientific community at large. What the scientific community values is ofcourse historically contingent. Anyone familiar with day to day scientific practice will experience this, even if they are not cognizant of it. Who and what gets funded, which papers are published, and who gets hired are all strongly socially determined. To give just one example, as a working scientist I have had a paper outright rejected by one journal with seemingly partisan reviews, and then accepted in another with only stylistic edits suggested. It is likely that the first set of reviewers were hostile to the research programme I adhere to, whilst the second set were fellow travellers. Its worth noting that despite this being a commonly observed phenomenon, scientists by and large appear to have an idealised conception of modernity and the

scientific method. As James C. Scott puts it, high modernism - the absolute faith in scientific progress - is,

> "the ideology par excellence of the bureaucratic intelligentsia, technicians, planners, and engineers. The position accorded to them is not just one of rule and privilege but also one of responsibility for the great works of nation building and social transformation."[2]

The reality of scientific practice - with all its interpersonal animosity and subsumption into the profit motive - is treated as the exception, whilst the abstract ideal is framed as the real scientific method. Kuhn provides a useful antidote to such idealism. However, the problems for demarcation are clear: because everything is conceived through the lens of the dominant paradigm, the history and methodology of science are rewritten with every paradigm shift, leaving us with no approach for demarcating between scientific progress and intellectual degeneration; science and pseudoscience become indistinguishable. Furthermore - as touched on in my example above - multiple research programmes are almost always running concurrently, often in antagonism with one another.

At this point we appear to be caught between two poles. Clearly Kuhn's turn toward historicism - the notion that scientific practice is historically and socially determined - is a valuable corrective to the overly abstract conception of science as pure falsification. However with this overcorrection we have lost all ability to demarcate science from any other form of inquiry. One attempt to move beyond falsificationism and historicism was that of Imre Lakatos. Lakatos - a student of the Hegelian Marxist Gyorgy Lukacs - distinguished between progressive and degenerating research programmes. Where theory leads to the discovery of novel facts in the former, the degenerating research programme is characterized by the fabrication of theories in order to accommodate known facts. Indeed, a research programme can be active for a long while in a state of degeneration, and can even be restored to a progressive footing if the above criteria can be satisfied (this is certainly an important point in rela-

tion to Marxism, as we will see). Lakatos argued that the constituent parts of a research programme are the hard inner core of the programme - the so-called negative heuristic - that can never be directly rejected, and the auxiliary hypotheses - the positive heuristic, or protective belt - that face the onslaught of tests and tweaking in light of the outcomes of these tests. Lakatos gives us the examples of Newton's gravitational theory:

> "The classical example of a successful research programme is Newton's gravitational theory: possibly the most successful research programme ever. When it was first produced, it was submerged in an ocean of 'anomalies' (or, if you wish, 'counter-examples') and opposed by the observational theories supporting these anomalies. But Newtonians turned, with brilliant tenacity and ingenuity, one counterinstance after another into corroborating instances, primarily by overthrowing the original observational theories in the light of which this 'contrary evidence' was established. In the process they themselves produced new counter-examples which they again resolved. They 'turned each new difficulty into a new victory of their programme'."[3]

Scientific research programmes can be eliminated when a rival research programme explains the success of this prior programme, and supersedes it by a further display of heuristic power. A research programme is progressing as long as its theoretical growth anticipates its empirical growth. It is stagnating if its theoretical growth lags behind its empirical growth (providing only post hoc explanations of chance discoveries). Hillary Putnam provided a similar framework in *The Corroboration of Theories*, arguing that auxiliary statements are the boundary conditions that scientists actually test. These are the abstract models to which the set of laws (the scientific theory) are applied.

What Lakatos and Putnam provide is a framework in which science is historicised a la Kuhn, without the complete loss of distinction

from non-science. Crucially what we have here are a set of heuristics rather than a clear and objective demarcation.

> "The methodology of research programmes - like any other theory of scientific rationality - must be supplemented by empirical-external history. No rationality theory will ever solve problems like why Mendelian genetics disappeared in Soviet Russia in the 1950s, or why certain schools of research into genetic racial differences or into the economics of foreign aid came into disrepute in the Anglo-Saxon countries in the 1960s. Moreover, to explain different speeds of development of different research programmes we may need to invoke external history. Rational reconstruction of science (in the sense in which I use the term) cannot be comprehensive since human beings are not completely rational animals; and even when they act rationally they may have a false theory of their own rational action."[4]

Science is a fundamentally *social* endeavour, and can therefore never be the purely rational mode of inquiry that scientists often claim it to be. The anarchist philosopher of science Paul Feyerabend was even more explicit about the malleability of science as method:

> "The idea of a method that contains firm, unchanging, and absolutely binding principles for conducting the business of science meets considerable difficulty when confronted with the results of historical research. We find, then, that there is not a single rule, however plausible, and however firmly grounded in epistemology, that is not violated at some time or other. It becomes evident that such violations are not accidental events, they are not results of insufficient knowledge or of inattention which might have been avoided."[5]

We can point to some practical ideals that scientists might strive for (and both inductive logic and falsification are important parts of this), and broader heuristics based on the history of scientific inquiry, but we cannot pin down an eternised objective conception of science because one does not - and crucially cannot - exist.

Modelling

Before moving on, it is worth lingering briefly on modelling, a ubiquitous aspect of the scientific process. In the first Black Lamp editorial, I described a model as a representation of reality:

> "Every model is a reduction (abstraction if we want to get technical). The extent of this reduction is dependent upon the system being modelled, but the crucial point is that the boundaries of a specific model are not open to interpretation, they are explicit. Whether the model itself is a useful and accurate representation of the system being modelled is an important and relevant question, but that is the point! We can debate the relevance of a model because the model itself is explicitly stated."[6]

We can go further, as Paul Mattick does, and describe the distinction between abstraction and idealisation:

> "Where abstraction is a matter of 'leaving things out, while still giving a literally true description,' idealisation treats 'things as having features they clearly do not have,' to produce a description of a system 'that *fictionalizes in the service of simplification.*"[7] (his emphasis).

It is immediately evident that modelling covers a vast expanse, and is not the exclusive domain of science. Indeed, models are how we unconsciously conceive of the world and its immense multitude of interconnections, enabling us to simplify complex systems and mask the parts

which are assumed superfluous to understanding the processes of most concern to us. However it is also clear that modelling is a core aspect of practical scientific activity. Inductive logic revolves around the isolation of a variable of interest and repeated testing. The interaction between the independent (assumed casual) variable and the dependent (affected) variable is a model, and the ability to replicate the interaction via experiment facilitates a level of confidence in the uncovered interaction. Where the number of variables involved are large, often computer simulation is used to model a system. This is a model in which parts and their interactions are described (i.e. modelled) mathematically to understand what happens when some of these parts, or their effects are changed. Whether these models are the abstraction or idealisation as described by Mattick, or some combination of both, they will always be a simplification of reality in an attempt to understand it better.

Once more we see that the scientific method draws largely on everyday practice and experience. This should not be remotely surprising. Science is after all a human endeavour (indeed it goes beyond just humans - a number of animals have been shown to experiment within their environment, be it with tool use or hunting). This runs contrary to the idealised notion of science that we are often sold, that of a science that operates outside of the rest of human practice and outside of the social and historical biases and ideologies that the layperson is subject to. Now we have laid down a foundation from which to think about Marxism and strategy as science. Before continuing I would emphasize that this is a whistlestop tour of useful concepts that will be applied in this essay. I have elided over a number of nuances that will likely leave professional philosophers of science exasperated. However this is enough of a foundation for what comes after, without succumbing to a thousand rabbit holes.

Marxism as science

The Marxist interest in science is as old as the tradition itself (Helena Sheehan's *Marxism and the Philosophy of Science* is an excellent primer on the topic for anyone interested, most notably for how the author captures the back and forth dialogical nature of how the debate evolved). Sheehan's orienting question is an important and clearly articulated one:

> "How can science be the complex, uncertain, precarious, human process that it is - inextricably bound up with all sorts of philosophical assumptions and with all sorts of wider sociohistorical processes - and still be reliable knowledge of nature?"8

I do not wish to get tangled up in the Marxological debates on whether Marx and Engels agreed on the notion of scientific socialism. Rather I want to get at some historically workable definitions of dialectics, historical materialism, and scientific socialism (though inevitably many will disagree with any definition as these are contested terms). Michael Burawoy argues that a chief point of rupture within the Marxist tradition is between,

> "…*scientific* Marxists who attempt to establish laws of economic development in analogy to the laws of the natural sciences, and *critical* Marxists who deny the existence of any fixed determinism and concentrate on the irrationality of capitalism, the gap between what is and what could be."[9] (his emphasis).

Here I will focus mostly on scientific Marxism, though critical Marxism will be addressed at the end of this essay. With regards to the former, in his Anti-Duhring and unfinished Dialectics of Nature, Engels articulated a set of dialectical laws which operate both in society and in nature. He argued that the laws of dialectics are abstracted from the history of nature and human society:

> "For they are nothing but the most general laws of these two aspects of historical development, as well as thought itself. And indeed they can be reduced to three: The law of the transformation of quantity into quality and vice versa; The law of the interpenetration of opposites; The law of the negation of the negation."[10]

Here dialectics has a metaphysical quality to it, and Engels is explicit that his concern is "showing that the dialectical laws are real laws of development of nature, and therefore are valid also for theoretical natural science"[11]. The main takeaway here is that the three laws of dialectics Engels highlights above are general laws applicable not just to society, but to nature too. As Paul Paolucci puts it, "Engels's laws are not simply analytical frameworks for studying the world but are also *forces* in nature and society"[12] (his emphasis). These are laws of motion that are independent of any subjective element. Where dialectical materialism as articulated by Engels described the laws of motion of the social and natural world, historical materialism was the application of dialectics to history. What are the implications of these laws? If history is subject to immutable laws of motion, then those who understand those laws - i.e. Marxists - are the scientists of historic process. The past can be modeled in terms of these three laws, whilst they also provide the basis for a prescriptive analysis of the future. The appeal of such a conception is obvious. I am intentionally sidestepping the question of whether Marx and Engels were in agreement here, or whether Marx's thinking changed over time. Indeed, Marx's *A Contriubtion to the Critique of Political Economy* certainly draws out the postulates of historical materialism (i.e. dialectics applied to history). The following quote is lengthy, but necessary, as we find in it a clear articulation of a stagist conception of history:

> "In the social production of their existence, men inevitably enter into definite relations, which are independent of their will, namely relations of production appropriate to a given stage in the development of their material forces of production. The totality of these relations of production constitutes the economic structure of society, the real foundation, on which arises a legal and political superstructure and to which correspond definite forms of social consciousness. The mode of production of material life conditions the general process of social, political and intellectual life. It is not the consciousness of men that determines their existence, but their

social existence that determines their consciousness. At a certain stage of development, the material productive forces of society come into conflict with the existing relations of production or – this merely expresses the same thing in legal terms – with the property relations within the framework of which they have operated hitherto. *From forms of development of the productive forces these relations turn into their fetters. Then begins an era of social revolution. The changes in the economic foundation lead sooner or later to the transformation of the whole immense superstructure.*

In studying such transformations *it is always necessary to distinguish between the material transformation of the economic conditions of production, which can be determined with the precision of natural science*, and the legal, political, religious, artistic or philosophic – in short, ideological forms in which men become conscious of this conflict and fight it out. Just as one does not judge an individual by what he thinks about himself, so one cannot judge such a period of transformation by its consciousness, but, on the contrary, this consciousness must be explained from the contradictions of material life, from the conflict existing between the social forces of production and the relations of production. No social order is ever destroyed before all the productive forces for which it is sufficient have been developed, and new superior relations of production never replace older ones before the material conditions for their existence have matured within the framework of the old society.

Mankind thus inevitably sets itself only such tasks as it is able to solve, since closer examination will always show that the problem itself arises only when the material conditions for its solution are al-

> ready present or at least in the course of formation. In broad outline, the Asiatic, ancient,[A] feudal and modern bourgeois modes of production may be designated as epochs marking progress in the economic development of society. *The bourgeois mode of production is the last antagonistic form of the social process of production – antagonistic not in the sense of individual antagonism but of an antagonism that emanates from the individuals' social conditions of existence – but the productive forces developing within bourgeois society create also the material conditions for a solution of this antagonism. The prehistory of human society accordingly closes with this social formation.*"[13] (my emphasis).

The debate around how much Marx agreed with Engels' conception of dialectics will probably continue so long as Marxism persists as a live body of thought. However it is hard to miss the dialectical laws Engels described in the above paragraphs from Marx. There is the progress of history in a series of punctuated equilibria, whereby the forces of production develop in interaction with the relations of production (quantitative progress), before these relations eventually become fetters on that development, leading to rupture of social revolution (qualitative change). Thus the mode of production contains within it its own negation. Marx is explicit here - "*the material transformation of the economic conditions of production can be determined with the precision of natural science.*" This is all the invitation we need to attempt to hold Marxism to the level of rigor we would any scientific hypothesis.

Before continuing, I emphasise again that I am not concerned with how much Marx's views changed over the course of his life (which surely they did, just as every single one of us changes over time). What is relevant here is not reclaiming Marx for one argument or the other, but drawing out the implications of the conception of dialectics as articulated above by Engels and concretised by Marx. These implications are indeed significant for the strategic orientation of Marxists, for this conception of

a scientific socialism was the undergirding assumption of the majority of the debates during the period of classical or orthodox Marxism (i.e. the years of the second international, and the decade following its collapse). Take as an example Rosa Luxemburg's pamphlet *Reform or Revolution*. Though Luxemburg rejects the inevitability of socialism, subjective agency is set against the objective, historic *necessity* of socialism:

> "The greatest conquest of the developing proletarian movement has been the discovery of grounds of support for the realisation of socialism in the economic condition of capitalist society. As a result of this discovery, socialism was changed from an 'ideal' dream by humanity for thousands of years to a thing of historic necessity."[14]

If socialism is a necessity, those who understand the laws of motion of history must inevitably lead, as Lenin clearly argued in *What is to be Done?*:

> "We said that *there could not yet* be Social-Democratic consciousness among the workers. This consciousness could only be brought to them from without."[15] (his emphasis).

And ofcourse by Karl Kautsky (as quoted by Lenin in *What is to be Done?*):

> "Modern socialist consciousness can arise only on the basis of profound scientific knowledge…The vehicles of science are not the proletariat, but the *bourgeois intelligentsia*"[16] (his emphasis).

The reasoning here is sound. If you want to understand the laws of motion of particles, you defer to particle physicists who have studied these matters in great detail. If you want to understand the laws of evolution you defer to the evolutionary biologists who specialize in this area. If

you want to understand the laws of motion of history, you must therefore defer to those who understand the laws that govern the motion of history. The logical implication of such an argument is that of the necessity of a vanguard, as elucidated in Lenin's *What is to be Done?* (As a brief aside, it is precisely this division of labour, and level of specialisation to the extent that individual disciplines are carved off from one another, that cannot exist under Communism. It is not so much that every cook can be a scientist, but that every cook has the capacity to engage with the scientific process without having to defer to experts with no ability to critique. That is the rational kernel of democratizing knowledge and activity). Given this brief background, it is now necessary to look at how Marxism as Science has held up in the face of the unrelenting march of history.

Marxism - falsified or otherwise

Taking the conception of Marxism as science described in the preceding section, how can we evaluate its efficacy? I have already argued that science is a rather messy concept with no strict definition. However several aspects (or heuristics) of the scientific process were highlighted, including inductive logic, falsification, theoretical growth that anticipates empirical growth, and modeling. Taken alone, or even taken together, they do not provide a watertight definition of scientific practice, but they do give us something to work with. Firstly it is worth noting that the "soft" sciences face limitations relative to the natural sciences. It is practically impossible to model a complex system (what cybernetician Stafford Beer would call exceedingly complex systems - systems whose behaviour cannot be predicted with perfect accuracy but can be studied probabilistically) without a large degree of abstraction (i.e. simplification), simply because there are too many variables to account for. Whilst this is a challenge in the natural sciences, it is even more so when modelling social systems. This places a heavy emphasis on the art of abstraction itself, something Marx himself was acutely aware of:

> "The value-form, whose fully developed shape is the money-form, is very elementary and simple. Nevertheless, the human mind has for more than 2,000 years sought in vain to get to the bottom of it

> all, whilst on the other hand, to the successful analysis of much more composite and complex forms, there has been at least an approximation. Why? *Because the body, as an organic whole, is more easy of study than are the cells of that body. In the analysis of economic forms, moreover, neither microscopes nor chemical reagents are of use. The force of abstraction must replace both.* But in bourgeois society, the commodity-form of the product of labour — or value-form of the commodity — is the economic cell-form. To the superficial observer, the analysis of these forms seems to turn upon minutiae. It does in fact deal with minutiae, but they are of the same order as those dealt with in microscopic anatomy."[17] (my emphasis).

This might be my favorite passage in all of Marx's writings, because it captures the essence of his methodology in his magnum opus. Tucked within it is an acute awareness of the necessity of being able to zoom in and out of the system of study, or what Bertell Ollman calls "extension":

> "Operating rather like a microscope that can be set at different degrees of magnification, this mode of abstraction enables us to see the unique qualities of any part, or the qualities associated with its function in capitalism, or the qualities that belong to it as part of the human condition (to give only the most important of these levels of generality)."[18]

You can only understand the interrelation of the parts of a system by being able to focus in on their internal behaviour, as well as zoom out to view their interaction with other parts. We will return to these ideas later, but first there is another important obstacle to highlight. Just as social systems cannot be physically dissected, neither can they be placed under controlled experiment to produce numerous replications from which to

derive some level of statistical information. Likewise, there are too many interacting variables at play to mathematically model these systems. We cannot rerun the Bolshevik revolution hundreds of times to understand the possible range of outcomes. Instead our sample size of revolution is small, and each historic revolution has an exceedingly high level of specificity that must be understood before overarching conclusions about the revolutionary process can be made.

With these important qualifiers in mind, we can attempt to evaluate the conception of Marxism articulated in the preceding section as a science.

Orthodox Marxism - theory and evidence

In the tradition of Popperian falsification, a theory is scientific if it can be evaluated by experiment. Only in this way can it be robust to falsification and therefore avoid rejection. By Popper's own admission, Marx's theory of the collapse of capitalism (by which he means the stagist conception of history in which capitalism must inevitably give way to communism, by way of a bourgeois revolution that sweeps away the fetters that exist under pre-capitalist social formations) was scientific in conception. However, Popper argued that this theory of collapse was falsified - the collapse of capitalism did not happen - and therefore Marx's theory must be rejected. He further criticised Marxists for reinterpreting both theory and evidence, rescuing Marx from refutation. For Popper, the theory had been falsified and must therefore be rejected in toto. Had he been around to read it, Popper might accuse Marxism of what Alvin Gouldner describes as the lure of normalization:

> "A theory, in short, is expected and permitted to be at war with other theories but not with itself; thus when internal contradictions are glimpsed, theorists are exposed to powerful pressure to *normalize* their theory. To "normalize" is an effort to reduce the dissonance between how an object is *supposed* to appear and how in fact it seems to be, by treating it as if it really was what it was supposed to be;

> by actually perceiving its traits as they should be; or denying or ignoring 'improper' traits."[19] (his emphasis).

In short, Marxists have reinterpreted both theory and evidence to reduce the distance between the two, thereby rescuing a theory that should - atleast in Popper's scientific framework - be relegated to the dustbin of history.

Ofcourse - as we have already discussed - science is not so utopian or dehistoricised as Popper might have us believe. Many a theory has been rejected and yet held onto by scientists and later corroborated, either via new data or methodological approaches, or by the throwing out/bolting on of auxiliary statements - the external aspects of the core theory that can indeed be tested, attenuated, falsified and thrown out without the core theory being proven true or false. In the case of the Marxist notion of the inevitability of communism, the unfolding of history has provided new data refuting this aspect of Marxism. It is easy to see why communism seemed inevitable during the height of the global workers' movement - a movement that won tangible concessions for workers. Indeed, this somewhat linear sense of progress in terms of an expanding working class driven by the expansion of the forces of production in the developed world led Eduard Bernstein to revise Marxism wholesale, positing an evolutionary, gradual path to socialism via these ongoing processes that he had identified. It is notable that Bernstein was responding to tendencies he observed within the German working class of the late 19th century; specifically reformist tendencies involving subsumption into the realm of bourgeois democracy via parliamentary politics. Where orthodox Marxism assumes capitalist accumulation will situate wage laborers together, with systemic contradictions resulting in the radicalising of the proletariat, Bernstein saw the working class and its institutions - both party and unions - being assimilated into bourgeois democracy, fighting for a larger slice of the distributional pie, as opposed to a complete overthrow of the capitalist mode of production. Indeed, Michael Burawoy argues - in a Lakatosian framework as described above - that Bernstein's departure from the Marxist core is such that he had produced an entirely new re-

search programme (i.e. a new negative heuristic) as opposed to modifying the auxiliary aspects of the programme (the so-called positive heuristic). Burawoy goes on to describe Rosa Luxemburg's refutation of Bernstein in her pamphlet Reform or revolution (where she both critiques Bernstein's failure to distinguish between the interests of the individual capitalist and the reproduction of capitalism in toto, and also theorises the mass strike as a weapon not limited to anarchism) as a defense of the core Marxist research programme. Luxemburg achieved this by developing auxiliary hypotheses that could explain the working class's assimilation into bourgeois democracy:

> "But capitalism furnishes besides the *obstacles* also the only *possibilities* of realizing the socialist program. The same can be said about democracy."[20]

Luxemburg was thereby responding to valid scientific critiques levelled at the Marxist programme by Bernstein. Neither theorist was willing to let the Marxist programme degenerate in the face of new evidence. However it was Kautsky - Burawoy argues - that was willing to dilute the empirical content of Marxism by denying the anomalies that history was presenting and holding onto the notion that a successful transition to socialism can only take place when the material conditions are ripe. Because conditions were not ripe, then revolution was premature. As Burawoy puts it,

> "He (Kautsky) dealt with the divergence between theory and reality by projecting their convergence into an unspecified future. He neither reconstructed the core nor created a new theory."[21]

This is clearly a violation of any notion of science that we might posit. Marxism is stripped of any prescriptive potential. In sum, if the data does not match the theory, we must wait until it does! In the language of Gouldner, Kautsky was attempting to normalize reality to fit with the theory, whilst Bernstein and Luxemburg recognised the insufficiency of the theory to explain reality. It is notable that Bernstein is often viewed as

a figure of betrayal, theorising away from revolution and toward assimilation. Bernstein however, was acting within the spirit of scientific Marxism, throwing out orthodoxy in the process. Ofcourse, it is true that Bernstein's research programme was rapidly refuted with the onset of global inter-imperialist hostilities, culminating in World War 1, but identifying the failings within Marxism in light of reality was an important step. The crucial point is that Bernstein's evolutionary socialism was a programme utterly distinct from the core Marxist programme.

Research programmes as strategy; auxiliary statements as determinants of tactics

Two points become evident from the preceding section. The first is that a research programme is the theoretical underpinning of strategy. In his piece on Strategy and Tactics, Dan Frost noted that "the strategist takes a top-down view and writes up the rules of the world,"[22] whilst Mike MacNair notes that "the essence of 'revolutionary strategy' is its *long-term* character: it is the frame within which we think about how to achieve our goals over the course of a series of activities or struggles, each of which has its own tactics."23 What is strategy then, if not the process of abstraction, i.e. the process of modeling the state of a system. Within any model, or research programme, or strategy are a number of assumptions. In the conception of Orthodox Marxism outlined above, one example assumption was that of the inevitability of communism, via the radicalisation of the working class as it became fully subsumed into wage labor. History proved this assumption to be erroneous. Bernstein's response was to junk the whole Orthodox Marxist strategy, because the assumptions of this strategy had been proven false. Luxemburg by contrast bolted on a further auxiliary statement to explain why the working class had not been continually more radicalised. The underlying research programme/strategy was maintained, with the auxiliary statement explaining the lack of alignment between the Marxist model of the world and reality. Within this auxiliary statement lay the retheorising of the mass strike as a tactical weapon. Thus the core theory remained intact, whilst the tactics were attenuated to respond to real world data. Practicing scientists do the same, as discussed above. Auxiliary hypotheses are developed to attempt to explain discrepancies, whilst the core research programme remains intact.

Within this framework I can see no reason why we cannot call Marxism a science. Indeed, the real question should not be about whether Marxism is a science, but whether it is good science. Any model can be fine tuned until its logical basis is coherent, but the most important question is always whether it is an accurate representation of reality. Of course the question of whether any research programme or strategy is good science is not a static one. Ultimately we are asking a similar question to the one asked by Lakatos: Is a research programme progressive, or is it degenerating? And ofcourse, the research programme/s that constitute Marxism have changed over time.

This brings us neatly onto the second point that is evident from the preceding section. Multiple research programmes - and indeed multiple versions of research programmes - are live at any given time. Even those that have degenerated might be resuscitated in light of new evidence and a changing environment. Though the inevitability of communism may have been taken as a given in the late 19th and early 20th centuries, two world wars, the Keynesian post-war rebuild, the advent of neoliberalism (driven by the long post-1973 crisis) and the collapse of the Soviet Union have so radically altered the global landscape as to shake even the most optimistic of Marxist forecasts. So what are some of the more coherent extant research programmes within the Marxist tradition that exist today? And can we evaluate their progressive and degenerative content? This will involve attempting to identify their underlying assumptions and assessing them relative to the world around us, which is a trickier endeavor with social systems due to processes that cannot be quantified such as ideology.

Though this is by no means an exhaustive list, I will briefly attempt to evaluate the scientific content of two research programmes: The strategy of patience/merger formula, and The theory of riot. These choices are Global North focussed. This is regrettable, but I aim to talk about what I know and understand. After all, science is an attempt to understand reality, and I cannot speak with any confidence about strategic frameworks which are being developed and enacted in environments with which I have little familiarity.

The strategy of patience and merger formula

Recent years have seen the resurgence of an interest in Kautsky's strategy of patience, with its new iteration being variously called Neokautskyism, Orthodox Marxism, or just Leninism, depending on who is espousing or critiquing it. Mike MacNair's *Revolutionary Strategy* has been hugely influential on this milieu, providing a relitigation of Orthodox Marxist strategy and its relevance for the modern day. It is worth stressing how important this book was for my own thinking. MacNair's focussed approach whereby he defines his categories, and carefully follows the links in his chain of argumentation results in a work which forces the reader to concretely think about revolutionary strategy without hand waving mystification, without confusing strategy for tactics, and without falling back on moralism. Indeed, it is a model approach for discussing strategy in my opinion.

MacNair describes the strategy of patience as the strategic orientation of the Marxist centre, relative to the Marxist right and left:

> "The centre's strategic line was, then, a strategy of patience as opposed to the two forms of impatience; those of the right's coalition policy and the left's mass strike strategy. The strategy of patience had its grounds in the belief that the inner-logic of capital would inevitably tend, in the first place, to increase the relative numbers and hence strength of the proletariat as a class, and, in the second, to increase social inequality and class antagonism."[24]

He goes on to describe the strategy of patience as articulated by Kautsky in *The Social Revolution* as follows:

> "This strategic line can be summed up as follows. Until we have won a majority (identifiable by our votes in election results) the workers' party will remain in opposition and not in government. While in opposition we will, of course, make every effort

> to win partial gains through strikes, single issue campaigns, etc, including partial agreements with other parties *not amounting to government coalitions, and not involving the workers' party expressing confidence in these parties.*
>
> When we have a majority, we will form a government and implement the whole minimum programme; if necessary, the possession of a majority will give us legitimacy to coerce the capitalist/pro-capitalist and petty bourgeois minority. Implementing the whole minimum programme will prevent the state in the future serving as an instrument of the capitalist class and allow the class struggle to progress on terrain more favourable to the working class."[25]

MacNair highlights the assumptions underlying this strategy that we have already seen did not hold up to reality: An increase in numbers and strength of the proletariat, and an increase in social inequality and class antagonism. Going further, the neoliberal turn further decimated the strength of the proletariat, and whilst inequality has exponentially increased, class antagonism has been numbed, relative to its peaks in the 20th century. This brings us to the merger formula, in which the socialist movement merges with the workers' movement to form a mass party, which is the agent of revolution. Implicit in this formula is of course the existence of a workers' movement. Rosa Janis has argued in Cosmonaut Magazine that the merger formula is,

> "implicit in Marx and Engels' *Communist Manifesto*, Karl Kaustky's *The Erfurt Programme* and Lenin's concept of the vanguard party. The role of the socialist movement, according to the Merger Formula, is to develop the concept of socialism through theory and implant it into the consciousness of the workers' movement, which acts as the mass base for socialism. In this way, the socialist movement

> can be thought of as the mind of the revolution and the workers' movement its body. While some might reject such a formula as it implies that the workers are incapable of imagining socialism for themselves, this would be a simplistic misreading since—much like the literal mind and body—the socialist movement and the workers' movement are never completely separated: the socialist movement is made up of the most advanced elements of the workers' movement, and the workers' movement is made up of the most advanced elements of the socialist movement."[26]

Janis here softens the distinction between the socialist and workers' movement relative to how it was conceived of by Kautsky (again, quoted by Lenin in *What is to be done?*):

> "But socialism and class struggle arise side by side and not one out of the other; each arises under different conditions. Modern socialist consciousness can arise only on the basis of profound scientific knowledge."[27]

Kaustky is also explicit as to where this scientific knowledge comes from:

> "The vehicles of science are not the proletariat, but the *bourgeois intelligentsia*: it is in the minds of some members of this stratum that modern socialism originated, and it was they who communicated it to the more intellectually developed proletarians who, in their turn, introduced it into the proletarian class struggle where conditions allow that to be done."[28] (his emphasis).

This is as clear a framing of the Marxist as scientist expert as de-

scribed in the previous sections of this essay. Indeed, this framing has been central to many critiques of scientific Marxism and vanguardism - the separation of subject and object, of teacher and taught. Whilst these critiques are extremely important - as exemplified by Janis' softening of this dualism - this is not place for that discussion. What we are purely concerned with here is extracting the scientific content from the merger formula and strategy of patience.

Assumptions of the Strategy of Patience/Merger formula
So what are the assumptions of this model?

1. The existence of a socialist movement.
2. The existence of a growing workers' movement.
3. A mechanism by which to merge the two that coheres around the political content of the former.
4. The discipline to hold the line and not take power until a majority is achieved.
5. The time to build this majority.

As Janis' essay describes, these conditions have not been met yet. Socialists are largely scattered in an incoherent manner, and the workers' movement is still at a nadir (as measured by union membership and strike days). Thus the order of proceedings is to firstly cohere the socialist movement around a programme, and it is only with a coherent and disciplined socialist movement that the workers' movement can be rebuilt. So really, the prior aim is to create the conditions in which such a strategy is viable. This ofcourse leads to a set of prior assumptions:

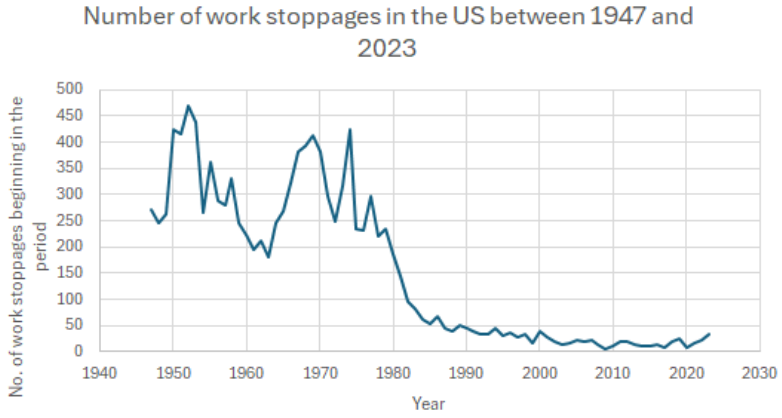
1. The socialist movement can be cohered.
2. The workers' movement can be rebuilt.

The first assumption leads to a number of tactical questions around how to cohere the socialist movement (in the US case for example, entering into the DSA and building it into a disciplined organisation cohered around a programme). The second assumption is where things get a little trickier. The common argument is that the tactics of the pre-Fordest era

- centering workers' parties and alliances between the employed and unemployed - fail to address the starkly different conditions between then and now, namely the current lack of high profit rates, productive capacity, and minimal labor protections which made for an era ripe for capital accumulation. In his book "Riot. Strike. Riot" (which is the theoretical undergirding for the next strategy I will discuss), Joshua Clover correlates the zenith of the workers' movement with that of capital accumulation:

> "The conditions that historically enable the socialist vocabulary - real accumulation, a taut labor market, the possibility of gaining power by appropriating a share of that accumulation, an expanding industrial proletariat - no longer obtain. The progressive gains that might empower and embolden the mass party depending on labor organizing are no longer within reach as they were during economic growth, expansion, and boom."[29]

The plot below shows the number of work stoppages in the US between 1947 and 2023, with data taken from the US bureau for labor statistics website. What is notable is that the economic crisis of the early '70s correlates with a decline in labor struggles that has never recovered. Indeed, the recent uptick in labor disputes is significantly higher than the last few decades, but pales in comparison to the pre-'73 period.



Capital accumulation has stagnated, and with it demand for labor. Whilst there has been fluctuations between periods of crises, Aaron Benanav notes that,

> "global capitalism *is* failing to provide jobs for many of the people who need them. There has been, in other words, a persistently low demand for labor, one which is no longer accurately registered in unemployment statistics. Labor underdemand is reflected in higher spikes of unemployment during recessions, as in the 2020 pandemic recession, and in increasingly jobless recoveries, a phenomenon likely to be repeated in the pandemic recession's aftermath."[30]

In a review of Dan Evans' *A nation of shopkeepers*, I argued that this was due to the process of lumpenisation, and an expanding stagnant surplus population globally. Marx describes this category as:

> "a part of the active labour army, but with extremely irregular employment. Hence it offers capital an inexhaustible reservoir of disposable labor-power. Its conditions of life sink below the average normal level of the working class, and it is precisely this which makes it a broad foundation for special branches of capitalist exploitation. It is characterized by a maximum of working time and a minimum of wages."[31]

Returning to the strategy of patience and the Merger Formula, we can empirically show that the conditions that gave rise to the workers' movement that was such an integral part of initial orthodox Marxist theorising have qualitatively changed. What does it mean to go in and organise your workplace today, when precarious contracts, fragmented working conditions, and workers having to pick up multiple jobs to stay afloat is becoming more and more common? What does it mean when,

> "The social foundations on which the workers' movement was built have been torn out: the factory system no longer appears as the kernel of a new society in formation; the industrial workers who labour there no longer appear as the vanguard of a class in the process of becoming revolutionary"?[32]

These trends do not diminish the importance of workplace organising on the scale of the individual workplace, but they do call into question the return of a powerful workers' movement as an undergirding assumption of a revolutionary strategy. As far as I can tell, this has simply not been addressed in any concrete manner by adherents of the Strategy of Patience/Merger formula. Deindustrialisation and the shifting nature of work are not mentioned in MacNair's *Revolutionary Strategy*, and whilst other commentaries on this strategy acknowledge the decimation of the workers' movement, the underlying assumption is that it can be rebuilt in mass form. In short, the workers' movement has become a hollowed out container, despite its foundational status within the Strategy of Patience/Merger formula. Although the workers' movement itself has not been eternised as a permanent entity, the category itself has become more assumed than explained. In other words, the line of argumentation is that the workers' movement was the vehicle of socialist power once, and therefore it *must* be again. The question then, is can it be, given the conditions that gave rise to it are so different to those that exist now? The failure to address this point is the root of the degeneration of the Strategy of Patience/Merger formula as a scientific research programme.

Joshua Clover's theory of the strike

It is somewhat appropriate that Joshua Clover provides us with a periodisation which explains the rise and fall of the workers' movement, given that the second of our strategic orientations to critique is also his theorisation. These are not mutually exclusive. Put concisely, Clover argues that the strike as a weapon - and with it the rise of the workers' movement - are directly linked to capital accumulation, *not* capitalism as a mode of production *in toto*:

> "The social content of the strike is also *productivity itself*, and this is all-important. It is not 'capitalism' in some abstract or general sense from which the strike depends…An evident if often neglected fact is that the limited, demand-based strike's effectiveness by and large coincides not with capital's frailty but with it's vitality, when the wage-commodity circuit is yielding surplus value and accumulation. When production is not expanding, a capitalist has less interest in preserving its continuity and may endeavour to outlast strikers."[33]

Clover argues that with capital accumulation well and truly stalled, the strike (a point of production struggle over the wage) has given way to the riot (a struggle over prices, i.e. over social reproduction), and with this transition the locus of proletarian power has shifted from the workers' movement (agent of the strike) to the mass mob (agent of the riot). This is the crux of his critique of orthodox Marxism, that the socialist horizon of programmatism,

> "accurately refracts the real conditions of the world in which it arises…it arises with the rising power of industrial labor, which is why workers in this sector are able to stand as the revolutionary class fraction. Their growth is capital's expansion. This does not, however, imply an immutable standpoint or form of struggle…It is from the far side of accumulation's rainbow that programmatism's historical limits become evident. When the class fraction that centered the program era no longer exerts a peculiar power over capital, such a course of struggle is foreclosed."[34]

With capital accumulation as the seemingly necessary condition for the workers' movement, the Strategy of Patience/Merger formula needs to be able to explain how a powerful workers' movement as revolu-

tionary subject can be rebuilt in the absence of accumulation, where the long post-'73 downturn has resulted in the patterns of underemployment described in the last section. In *Revolutionary Strategy* MacNair argues that because the Marxist centre "addressed neither the state form, nor the international character of the capitalist state system and the tasks of the workers' movement, the centre's strategy collapsed into the policy of the right when matters came to the crunch"[35]. Here MacNair is using auxiliary hypotheses to explain why the Strategy of Patience failed. However, the failure to explain *how* that workers' movement can be rebuilt in the absence of capitalist accumulation results in the degeneration of the research programme, resting as it does on assumptions unsubstantiated by history (i.e. a global workers' movement built in an era absent of accumulation).

Before we move onto Clover's theory of riot, I must emphasise that this is not an attack on the MacNairist programme, nor an attack on the much weakened workers' movement. The programmatic demands that MacNair argues for in *Revolutionary Strategy* - centered around democratic republicanism - are important and place necessary foundations for countering bourgeois rule, and the necessity for cohering the revolutionary left is self-evidently important for building networks and community. What I have tried to do is dispassionately evaluate the scientific content of the Strategy of Patience/Merger formula. It may also happen that capital finds a way to kick start accumulation. Though the crisis times we are in have a qualitatively different flavour in light of climate collapse, capitalism has found innovative ways to escape "final crisis" time and again, and though it seems unlikely, may do so again. In different conditions the Strategy of Patience/Merger formula may once again feel appropriate, regaining a progressive scientific content (remember, no research programme is ever binned for good!).

One important point to briefly linger on is the 5th of my list of assumptions of the Merger Formula/Strategy of Patience: that is the time to build the socialist majority. Given the speed of climate collapse, the Strategy of Patience is by its very nature temporally desynchronous to the moment we live in. There is more than a hint of irony in my raising

of this point, given that *The Black Lamp* has advocated for the space and time to think through our moment and theorise appropriately for it. This temporal desynchronisation is the jarring reality for communists today, one which haunts our generation more than any other.

Joshua Clover's theory of the riot

If the strike and the workers' movement are at their most potent at the apex of capital accumulation, Joshua Clover argues that the riot is the dominant form of struggle outside of these moments. I shall attempt to do Clover's framework justice, but I would recommend his book to everyone. Just as with MacNair, his is a powerful and thought provoking framework, even if the reader may not agree with his conclusions. Briefly, Clover starts with Giovanni Arrighi's Braudelian account of cycles of increasing and falling accumulation:

> "In the shift that follows crisis, capital, unable to generate adequate surplus value or growth through conventional manufacturing production, is compelled into the space of circulation to compete for profits there, by decreasing costs and increasing turnover time for an ever greater volume of commodities. Struggles in this space are thus central to each given capital's ongoing existence. There is scant imitation that this generates accumulation in the manner of industrial production."[36]

The complete sequence moves from circulation to production to circulation once more:

> "The recurrent structure is a tripartite sequence beginning with a financial expansion originally led by merchant capital; material expansion 'of the entire world economy' led by manufacturing or more broadly industrial capital, in which capital accumulates systematically; and when that has reached its limits, a final financial expansion. During this

> phase, no real recovery of accumulation is possible, but only more and less desperate strategies of deferral. Historically, the financial sector of the leading economy has in such a situation found a rising industrial power to soak up its excess capital, thus bank-rolling its own replacement. This new hegemon will form on necessarily expanded grounds, able to restore accumulation on a global scale but by the same token beginning from a position closer to its own limits for expansion."[37]

This periodisation is melded with Robert Brenner's thesis of a post-'73 long and terminal downturn:

> "The spiraling reach of long centuries may have run out of room to expand; reformation on a larger scale does not seem to be in the cards (though we should not too easily dismiss capital's ability to rescue itself from seemingly total crisis). Productive capital held sway from, say, 1784 to 1973. It may yet again. For the moment, this seems uncertain. Far from underwriting a rising hegemon, the United States in its decline is - despite its hypertrophied financial sector - ending its run as a massive debtor nation. It is now possible to argue that, even at a global or systemic level, capital finds itself in a phase of circulation not being met by rising production elsewhere - a distinct phase we will inevitably have to name *circulation prime*."[38]

Circulation prime is the third part of the sequence circulation-production-circulation prime, with each moment in the sequence signifying the dominant logic of accumulation (in other words financial accumulation followed by productive accumulation followed by financial accumulation to complete the cycle). Clover's insight is that the riot and the strike as the dominant forms of struggle map onto this cycle such

that riot-strike-riot prime are the dominant moments relevant to circulation-production-circulation prime. What then is the distinction between the strike and the riot? The locus of the strike is the workplace; workers halting capitalist *production*. Consequently, the strike is a struggle over the price of labor power. By contrast, the riot is centered around *consumption*. It is a struggle over the price of the very market goods needed to reproduce oneself. There is no collective identity but dispossession.

It is the prime in each sequence (circulation-production-circulation prime and riot-strike-riot prime) that denotes the unique nature of the current long downturn identified by Brenner - a recovery and a restart of the cycle does not seem possible, as evidenced by the cycle of poorer recoveries post-crisis resulting in underemployment, noted by Aaron Benanav in the quoted passage above (see the section titled 'Assumptions of the Strategy of Patience/Merger Formula').

This is the core insight of the book. As Clover states in the Final Remarks of a symposium on Riot Strike Riot in Viewpoint Magazine,

> "The wagers are these: that the riot can now be thought as a fundamental form of class struggle rather than an impolitical spasm; that we can recognize in this the ascending significance of surplus populations within the dialectical production of capital's antagonists; and that the riot can be in turn seen as a sundial indicating where we are within the history of capitalist accumulation. One may haggle intellectually over periodization, but the existence and seriousness of the dossier together do a good job of telling time."[39]

The core scientific content - i.e. the core of the research programme - is clear here:

1. Brenner's long-downturn thesis.
2. Arrighi's tripartite periodisation.
3. The tracking of riot-strike-riot prime to circulation-produc-

tion-circulation prime

Form this descriptive framework, Clover produces a prescriptive model in the form of the commune:

> "The riot, the blockade, the barricade, the occupation. The commune. These are what we will see in the next five, fifteen, forty years."[40]

In an otherwise cautious account of historical dynamics, Clover's pivot toward the inevitability of the commune is somewhat surprising:

> "The commune, then, has a continuity with the riot. It presupposes the impossibility of wage-setting as a means to secure any manner of emancipation. It is likely to be inaugurated, like many struggles in the first era of riots, by those for whom the question of reproduction beyond the wage has long been posed - those who have been socially forged as the bearers of crisis…
> …At the same time, the commune also ruptures from the riot's basis in price-setting, because provisioning toward subsistence is no longer to be found in such action. It is beyond strike and riot both. In such a situation, the commune emerges not as an 'event' but as a tactic of social reproduction. It is critical to understand the commune first as a tactic, *as a practice to which theory is adequate*…
> …The coming communes will develop where both production and circulation struggles have exhausted themselves. The coming communes are likely to emerge first not in walled cities or in communities of retreat, but in open cities where those excluded from the formal economy and left adrift in circulation now stand watch over the failure of the market to provide their needs."[41] (his emphasis).

Here then is the auxiliary hypothesis to the core content - the inevitability of the commune, and we are finally in a position to evaluate the scientific content of Clover's theory of riot.

The programmatic notion of the commune

In *The Civil War in France*, Marx described the commune as,

> "Essentially a working-class government, the product of the struggle of the producing against the appropriating class, the political form at last discovered under which to work out the economic emancipation of labor."[42]

Clover cites this passage from Marx, suggesting - when combined with his arguing for commune as tactic - that proletarian self-governance will arise as a tactic in the face of failing social reproduction. Despite Clover's rejection of programmatism that we saw earlier, the advocation and prescription of the commune form ultimately reproduce many of the aspects of a political programme that he rejects in Orthodox Marxism. There is the deterministic element - here the inevitability of the commune - that in turn informs practice (i.e. the commune as tactic). However, what results is something far more incoherent than the Strategy of Patience/Merger formula, because the very notion of a programmatic subject is rejected. This is also why the commune is a tactic rather than a strategic orientation, sprouting up somewhat independently across heterogenous struggles. The commune then is a necessary tactic within Clover's framework, rather than one that springs from within a wider strategy. It is a logical consequence of the failure of social reproduction. However, one cannot help but feel that this is a somewhat handwaving leap from the otherwise careful periodization that makes up the core thesis. Indeed, it is clear that in the time since Clover wrote Riot, Strike, Riot, the commune form has not been reproduced across global struggles. It is hard not to agree with Alberto Toscano's summation in his contribution to the Viewpoint Magazine symposium:

> "Too much of this concluding narrative is mort-

> gaged to the idea - whose historical record in the age of strikes speaks for itself - that increasing immiseration is a driver of concerted challenge to the system, and that an increase in the incidence of revolts announces their coming composition. Banking on the utter fraying of state and capital, on a 'great disorder' from which will rise 'a necessary self-organisation, surivival in a different key' is weirdly optimistic for a text with such a keen emphasis on the 'limits' of struggles. Why fill the formal gap in the periodizing theory with this unnecessary horatory content? Why even name the commune, if it is not a social form or relation, but (as the book's last line declares) 'nothing but the name for …a peculiar catastrophe to come'?"[43]

Indeed, the descriptive and prescriptive elements cleave apart with ease, and one cannot help but feel that the necessarily scientific periodisation has great utility in explaining the degenerated aspects of Orthodox Marxism, whilst conjecture about the commune form has thus far failed to be proven correct and is too vague to even evaluate appropriately on any spatial or temporal scale. In summation, the linking of periodisations has great utility for the scientific evaluation of strategy. However the deterministic invocation of the commune appears to have no scientific basis whatsoever, leaving us in a somewhat contradictory position. Clover argues against programmatism and does not advocate any revolutionary strategy, but extracts a revolutionary tactic from his theoretical framework that is also an inevitability. With his vague timeline and no sense of the determining conditions that will generate the commune beyond the failures of social reproduction, we cannot even properly evaluate these claims against reality. Recall that for Lakatos, a degenerated research programme is one whose auxiliary hypotheses achieve no increase in explanatory power. By that definition the inevitability of the commune is degeneration, given that this hypothesis has no explanatory power due to its vagaries. However, the periodisation remains intact, and a valuable framework for scientific progress.

Science and critique

I mentioned the split between Marxism as science and Marxism as critique earlier and this is worth commenting on briefly. The core of the rejection of Marxism as science is rooted in the argument that Marxism is really critique, or critical science (as opposed to bourgeois science). John Holloway - who was part of the collective that published *Open Marxism* - argues that critical or revolutionary science,

> "...can only be negative, a critique of the untruth of existing reality. The aim is not to understand reality, but to understand (and, by understanding, to intensify) its contradictions as part of the struggle to change the world…
> …For Marx, science is negative. The truth of science is the negation of the untruth of false appearances."[44]

The tension between the scientific Marxism that has been the subject of this essay, and the critical Marxism as described by Holloway is baked into the very foundation of Marxism, from the writings of Marx onwards. The goal was always to change the world, but this necessitated interpreting it. The central question then, is whether it is possible to prescribe positive action, or simply to unravel the contradictions. I do not have a satisfactory answer to this question because - unlike the partisans of either path - I do not believe there is one, and this is because I do not believe in a static framework that is permanently relevant (i.e. a metaphysic). Certainly the prescriptive framework of Orthodox Marxism constituted a progressive research programme at a specific period in history. As I have argued above, I believe that moment has passed, and that the underlying assumptions of that programme no longer hold. However that does not mean that prescription must be done away with altogether. What I have attempted to do in this essay is work through the assumptions of a couple of research programmes to identify degeneration. This, after all, is what *doing* science is all about.

Mētis, dialectics, and systems theory

This essay has been almost exclusively focused with modern Western forms of investigation, largely due to my own familiarities and ignorances. I was however drawn to James C. Scott's description of Mētis in *Seeing like a State*, from which much of the detail of this section is drawn. Mētis is an originally ancient Greek concept that, broadly understood,

> "represents a wide array of practical skills and acquired intelligence in responding to a constantly changing natural and human environment."[45]

Its significance for this essay is in showing that the modern scientific method is by no means the only useful mode of inquiry for understanding and interpreting our world. Science – by its very nature – is a slow and conservative process. It is also a broadstroke process with a high level of abstraction involved. The more complex the system being investigated, the higher the level of abstraction. Mētis by contrast is concerned with experiential adaptation to rapidly changing environments (i.e. systems). As Scott puts it,

> "Mētis is most applicable to broadly similar but never precisely identical situations requiring a quick and practiced adaptation that becomes almost second nature to the practitioner. The skills of Mētis may well involve rules of thumb, but such rules are largely acquired through practice (often in formal apprenticeship) and a developed feel or knack for strategy. Mētis resists simplification into deductive principles which can successfully be transmitted through book learning, because the environments in which it is exercised are so complex and nonrepeatable that formal procedures of rational decision making are impossible to apply."[46]

Mētis then is extremely specific practical knowledge, relevant to a specific environment and its fluctuations within some bound. In other

words it is *local, contextual, and particular*. When I first read about Mētis I was incredibly excited at some of the analogues to systems theory and dialectics. Whilst Marxists have argued over what dialectics is, and what it is for - often with the terms of debate laden with mystification - I have found systems theory to provide an analogous framework, whilst eschewing the obfuscatory language of dialectics and facilitating the analysis of complex systems. In his review of Lewontin and Levins' now classic work of philosophy of science, *The Dialectical Biologist*, the evolutionary biologist John Maynard-Smith argued that the language of dialectics was obsolete, given the advances in mathematics and the establishment of systems theory:

> "One interpretation of dialectical materialism would be as follows. Marx and Engels wished to analyse the behaviour of highly complex systems. At that time, mathematics was adequate only for the description of simple dynamical systems. Therefore they were obliged to borrow from Hegel a set of verbal concepts, such as the negation of the negation and the change of quantity into quality. Today developments in mathematics make reliance on such vague verbal concepts less necessary. This argument can be made more explicit by considering the change of quantity into quality. We now have a mathematical language for describing such changes. Imagine a dynamical system described by a set of differential equations. If we gradually change the parameters in the equations, the behaviour of the system will also change gradually: for example, if the behaviour is to oscillate, then the period and amplitude of the oscillation will change gradually. But ultimately, as we continue to change the parameters, we reach a threshold, or 'bifurcation', at which the behaviour changes dramatically: for example, the system may cease to oscillate, and start to grow exponentially. This, I take it, is a mathematical de-

> scription of the change from quantity into quality. When one has played with a few systems of this kind, one has a better feel for how things are likely to behave."[47]

Now whilst the significant increase in computing power today means that we are capable of modelling the behavior of far more complex systems than in Marx and Engels' time, it is not - and will never - be possible to write down equations that model the totality - the entire system, a system so complex we could not even know all of its parts. What systems theory does provide us with however, is a framework within which to understand how parts of a whole (which can be modelled) interact, and how no system can be understood except relationally. These are the very qualities of extension and utilizing various vantage points that Marx employed in *Capital* (and crucially quite distinct from his approach in the introduction to *A contribution to the critique of political economy*), as discussed in this essay, as well as an approach to unravel contradictions which can inform future behaviour. Moreover, they move us away from the idea that science is all about isolating a variable from its environment and testing causation, i.e. Cartesian reductionism. The interaction between two variables in an isolated system can only ever give us limited information about the interaction between two variables within the complex systems they actually exist in. It is the interaction that is key.

Thus, not only does systems theory provide us with the tools of dialectics, but it does so without all the mystificatory bullshit that is as likely to shut down collective inquiry as it is to unravel the underlying contradictions within society. Mētis - like systems theory - attempts to understand system behaviour *within their specific environment*, and whilst the language and framework of systems theory is relatively new, Mētis has been a practical tool that one could argue goes beyond our species. It is the understanding of the specific system of focus, whilst systems theory facilitates knowledge of the interaction of systems. Whilst neither Mētis, systems theory nor dialectics provide us with an out-of-the-box revolutionary strategy, they do provide us with the tools for understanding how to navigate the heterogeneity and complexity of the social systems that we

wish to overturn. What does change look like at the local level? How does this interrelate with larger forces that the individual can rarely comprehend? This I believe is the starting point for revolutionary theory appropriate for the current moment.

Marxist scientists or sales reps?

I am a firm believer in the idea of Marxism as a science, but its practitioners have failed to consistently hold their espoused variants of Marxism to those standards. It is vitally important that we understand our collective revolutionary past. Indeed, many of the errors of the electoral, popular frontist left - constantly seeking alliances with class enemies - are a result of a failure to learn the lessons of history. However, we cannot pick up the programmes of history without concretely understanding our present either. Now, more than ever, Marxist historiography and critique feels far more robust than prescription. This is a direct consequence of a lack of meaningful power, which leads to underexplored assumptions. To give one example, there has been a vibrant and generative recent body of work on climate change and Marxism. However, many of these works feel the need to provide a prescriptive conclusion which is underbaked, whether it is a GND predicated on a workers' movement (as critiqued here), or a vague nod to decoupling from growth. With no pathway to enact these demands, it is no surprised that this is the form of prescription. Even where it is well worked through - as in MacNair or Clover - there are glaring assumptions that simply do not pass scrutiny. Which leads me to the question: Are we pitching a product, or are we scientists? This is not a reframing of the critique vs science argument, with science now switching roles. I do believe science can be used as a prescriptive revolutionary tool. The level at which prescription is viable may be, or may no longer be at the same scale as the Orthodox Marxism of old. This is why I espouse the system theoretic framework discussed above, because it enables us to evaluate across different scales. Bourgeois science is riddled with hypocrisy, with an often gaping chasm between its idealised self-conception and reality. I do not believe that systems theory or dialectics or whatever one wishes to call it is a catch-all solution, but it does help us think about how we might restructure the lab environment; about how the links in the funding chain are constituted; and what an alternative science absent

the profit motive might look like. This is the science that Marxists must espouse, one that is self aware and self critical, and not beholden to the bottlenecks of historic lineages.

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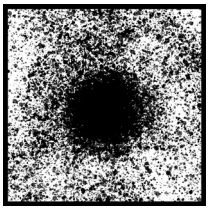

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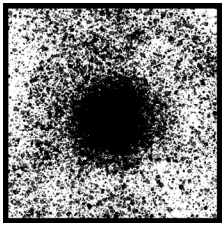

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