Paulin Hountondji on Dependency Theory and Technology

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Abstract: The Beninois philosopher, Paulin Hountondji, offers an account of technological development which emphasizes the importance of taking into consideration the global socio-economic context of technological development. This paper draws on Hountondji's theoretical insights in order to formulate a theory of technology which can provide a rigorous account of the relations between imperialism, capitalist social formations in the periphery, technological underdevelopment, and non-extraverted science in the Global South. This is accomplished through the development of a synthesis between some of the insights obtained from dependency theory, and the Hessen-Grossmann thesis. Despite its relevance to debates about industrialization and technological development in the Global South, the Hessen-Grossmann thesis has not received much attention in debates about overcoming technological underdevelopment in the Global South. The Hessen-Grossman thesis essentially states that the social forms that impede the development of productive forces (including technology) impede the development of science. From dependency theory we derive the claim that the form of capitalism that was introduced in African social formations through colonialism impeded the development of productive forces (and in some cases led to deindustrialization). From these two premises we arrive at the conclusion that colonialism was a social form that fettered the development of technology and science on the African continent. This framing, it is argued, provides us with a starting point for thinking about rural and urban industrialization in the Global South. Developing an adequate account of scientific knowledge that recognizes its dependence on pre-existing technology, is important for thinking about industrial policy in a manner that takes seriously pre-existing "indigenous" technology.

For Hountondji, science and technology are the mediating links in the causal nexus which connects philosophical discourse with economic structures. This idea has deep roots in Marxist approaches to the history and philosophy of science. Following Althusser, Hountondji claims that "philosophical revolutions" are dependent on "scientific revolutions". Such scientific revolutions are in turn dependent on experimental breakthroughs which in turn depend on technological advances, which are ultimately a function of the level of development of the productive forces of a given society: "These breaks [i.e., scientific revolutions] are not, of course, in themselves purely discursive events but rather theoretical effects in the field of discourse, of experimental practices which inform science throughout, practices organically linked to human material practices as a whole, employing various technical processes and hence dependent on the development of technology and therefore of the productive forces" (Hountondji 1996 [1983], 98; Hountondji 1976, 123). It is important to preempt the objection that Hountondji is somehow engaged in a reductivist economistic project here. Hountondji does not claim anything like a one-to-one correspondence between specific kinds of philosophical discourse and specific kinds of economic structures. Nor is he arguing that science develops in order to meet demands for technological improvement that

are put forward by those who own the means of production. Instead, it seems quite reasonable to interpret Hountondji's argument as a restatement of the Hessen-Grossmann thesis as reconstructed by Gideon Rosenthal and Peter McLaughlin. We should note that Hountondji never explicitly refers to the Hessen-Grossmann thesis in his writings, and it may be objected that he could not have known about it, because Hessen's paper on Newton was not translated into French until 2006 (Chimisso 2015, 65). However, Hountondji read both English and German. Moreover, an examination of the milieu of French philosophy of science indicates that versions of the Hessen-Grossmann thesis were in circulation, and that thinkers like Georges Canguilhem were engaging critically with Marxist approaches to the history and philosophy of science, and we do know that Hountondji studied the work of Gaston Bachelard and that he attended some of the seminars that were given by Canguilhem (Hountondji 2021, 53), hence it is not implausible to attribute to Hountondji some knowledge of the basic outlines of the Hessen-Grossmann thesis.[1] Admittedly, Hountondji's account of the relationship between philosophy, science, and technology is rather schematic, and our account will draw on contemporary work on history and philosophy of science in order to flesh it out. It is also interesting to note that we can detect the influence of Bachelard on Hountondji's conception of science, which, I will argue below, equates science with modern science. This conceptual move can be found in Bachelard (Chimisso 2003, 319). Moreover, Bachelard also emphasizes the importance of advances in technology for the development of modern science (Tiles 2006, 166). The emphasis on the importance of experimentation for modern science, which Althusser and Hountondji affirm, is also anticipated by Canguilhem who writes that "the concepts and the methods, everything is a function of the domain of experimentation" (quoted from Hans-Jörg Rheinberger 2005, 194). [2] However, both Althusser and Hountondji are externalists about the history of science (whereby developments in the history of science are seen to be the product, in the final analysis of the development of productive forces and changes in the relations of production), while Canguilhem was opposed to externalism in the history of science (Canguilhem 2005, 202 – 203).[3] Thus, while some elements of Hountondji's philosophy of science were the product of his study of the work of Bachelard and Canguilhem, there is also an important Marxist derived element which led to his departure from the kind of historical epistemology of science associated with Bachelard and Canguilhem.[4] My contention is that this Marxist element is best reconstructed as a version of the Hessen-Grossmann thesis.

According to the Hessen-Grossmann thesis, technology was developed in order to facilitate economic development, and early modern (seventeenth century) science was able to make the

[1] Moreover, emphasis on the French context explains Hountondji's style of doing philosophy of science, which draws heavily on the social sciences, which is quite different from the style of doing philosophy of science was predominant in the Anglophone world (Brenner 2010, 59; Chimisso 2010, 43). The influence of Canguilhem might also explain the manner in which Hountondji draws upon Husserl, for despite his agreement with Husserl's emphasis on the importance of something like a Cartesian starting point for philosophy that will enable it to critically examine all received assumptions, Hountondji does not seem to be interested in Husserlian phenomenology at all. Canguilhem's approach to the study of science is explicitly anti-phenomenological (Schmidgen 2014, 233) and this might have influenced Hountondji's own approach to Husserl.

[2] In addition to this, Althusser himself was quite explicit with respect to his debt to Canguilhem, see (Almeida 2018, 141).

[3] Although there are some interpretations of Canguilhem that make him out to be a sort of weak externalist, i.e., that developments in other spheres influence the history of science, but that these influences are not decisive for explaining changes in the history of science, see the interpretation in (Gattinara 2018, 20).

[4] Hountondji makes explicit reference to Bachelard and Canguilhem, for example, in (Hountondji 1996 [1983], 197, fn. 43; Hountondji 1977, 73, fn. 73).

advances that it did by studying the technology that was developed in order to facilitate economic development (Rosenthal and McLaughlin 2009, 4). However, according to this thesis, the purpose of early modern science was *not* the development of technology per se (let alone contributing to economic development), but rather the analysis of idealized structures (Rosenthal and McLaughlin 2009, 16). [5] Early modern physics dealt with idealized structures insofar as it relied on models that abstracted from reality, e.g., modeling cannon balls as point masses and assuming that projectiles were launched in a vacuum and not in a medium that offers resistance (air). Galileo, for example, studied idealized motion without friction and resistance (Wootton 2010, 231). To this extent it is clear that early modern science was not developed with immediate application in mind: "scientific knowledge developed only when it was not required to give immediate solutions to existing problems" (Rosenthal and McLaughlin 2009, 17). Galileo himself responded to Giovanni Battista Baliani that he did not really care if his work was not applicable to the real world, as long it was theoretically coherent, he would be satisfied (Wootton 2010, 232).

Boris Hessen advanced two more specific theses. The first thesis is that theoretical mechanics developed through the study of existing machine technology during the seventeenth century.[6] The point here is that, according to Hessen, a study of the relationship between technology and science in the seventeenth century shows that, contrary to what is commonly believed, existing technology was not developed by way of the application of theoretical mechanics (i.e., the common view that technology was applied science). Instead, Hessen argues that theoretical mechanics developed through the study of existing technology (Rosenthal and McLaughlin 2009, 11). In other words, he points out that if one looks at mining for example, the ventilation and draining of the mines were accomplished by air and water pumps. Those air and water pumps were not the products of technology conceived of as an application of a preexisting theoretical science, rather historically speaking aerostatics and hydrostatics developed as fields of research through the study of existing air and water pumps (Rosenthal and McLaughlin 2009, 4). Even historians of science who are hostile to the Hessen-Grossmann approach to the study of early modern science admit that the study of ballistics led to the development of Galileo's mechanics, albeit via an indirect path (Pyenson and Sheets-Pyenson 1999, 306). A key point made by Hessen and Grossmann is that the abstract idea of motion which was central to the development of mechanics was derived from the study of actual machines which transform rectilinear motion into circular motion and vice-versa (Rosenthal and McLaughlin 2009, 21).

The second thesis is that we can refer to technology (or its lack) in order to explain why a science of heat and its transformation into mechanical forms of energy did not develop in the seventeenth century (Rosenthal and McLaughlin 2009, 20). In short, Hessen argues that because steam technology was underdeveloped in the seventeenth century, a science of heat and its relation to other forms of energy could not be developed (Rosenthal and McLaughlin 2009, 22). In fact, it is well known that science of thermodynamics emerged from the study of the steam engine and the internal-combustion engine and not the other way around: "thermodynamics not only received an impetus to its development from the steam engine, but in fact developed from the study of that engine" (Hessen 2009 [1931], 79). As the historians of science Lewis Pyenson and Susan Sheets-

[5] Misinterpretations of the Hessen-Grossmann thesis on this specific point are quite common, e.g., (Pyenson and Sheets-Pyenson 1999, 89).
[6] Amongst modern African philosophers, J. Olu Sodipo provides an account that is quite similar, see (Sodipo 1985, 180).

Pyenson put it, "the steam engine did more for science than science did for the steam engine" (Pyenson and Sheets-Pyenson 1999, 269).[7] The point is that to think of technology as "merely applied science" (with science developing independently) is far too simplistic and ahistorical. In fact, as the philosopher of technology Barry Allen notes, "a characteristic of an advanced technoscientific economy is that problems arising at the technological frontier prime the research agenda of the sciences" (Allen 2008, 120).[8]

Hountondji does not explicitly refer to the Hessen-Grossmann thesis; however, he is drawing on a tradition of thought in which it is embedded, i.e., Marxist theorizing of the relationship amongst technology, science, and capitalism inflected through Althusser's influence.[9] Hountondji presents the formulation (which is essentially a recapitulation of the Hessen-Grossman thesis) above as a hypothesis that requires further empirical historical research.[10] Specifically he notes that it would involve answering some difficult questions, such as the possibility of discovering an experimental basis for calculus. Rosenthal and McLaughlin recognize the centrality of this question. They claim that "it can be shown that at least for some cases that the conceptualization of the infinitesimal in mathematics and of the mathematical concept of motion in mechanics were developed in one and the same argument and were dependent on the same experience with mechanical devices" (Rosenthal and McLaughlin 2009, 20). With respect to the infinitesimal calculus its conceptualization in terms of "motions" (or "fluxions") points to how the development of the mechanical notion of motion (which in turn was derived from the study of actually existing machines) was key to mathematical progress.

The key point is that Hountondji thinks that the development of technology is a necessary condition for the development of modern science. Modern science is in turn, according to Hountondji, a necessary condition for the development of modern philosophy. The question becomes is it possible to formulate a thesis that would, in general terms, describe the causal relations between technology on the one hand and capitalism as a mode of production on the other hand? Hountondji's answer, and that of other African theorists who were both influenced by dependency theory and helped develop it as a research paradigm, is *No*. For them, there is an important

[7] Nor should we discount the fact that many of the experimenters of the eighteenth century would not have been able to carry out their experiments or make their observations without the artisans who provided them with the necessary instruments. Without polishing and grinding techniques developed by artisans, the natural philosophers would not have been able to use their telescopes (Werett 2019, 90). Of course, some philosophers/natural philosophers, such as Spinoza (Nadler 2001) and Galileo worked with their hands themselves. In fact, as David Wootton points out, Galileo's telescopes were the best that were produced during his life time because, unlike other astronomers, he would grind his own lenses (Wootton 2010, 10).

[8] The role of technology in the development of science gets discounted in some recent discussions of the place of science and technology on the African continent, e.g., (Táíwò2014, 80-90). Táíwò is of course correct in saying that theoretical inquiry has a different aim from technology (i.e., a physicist need not be concerned with producing anything at all). However, he does not seem to recognize the manner in which technology in many cases served as a necessary condition for the development of theoretical scientific enterprises, e.g., the role of engineering (as instantiated in the Large Hadron Collider) in making it possible to undertake research in some areas of physics.

[9] Note that this approach is also more subtle than thinking of science as a branch of the productive forces in a social formation that is dominated by the capitalist mode of production; such a view has been ascribed to Marx by some interpreters (Rose and Rose 1976).

[10] It is unclear whether Hountondji ever read the work of Hessen or Grossman, since, as far as I know he never explicitly cites them. However, he may have learned of their work through Althusser or through direct contact with French philosophers and historians of science, a possibility which is explored below.

distinction between capitalism in the metropolitan countries and capitalism in the colonies (and ex-colonies). This is not to say that there are "two different capitalisms" in operation here. Rather the point is that, in the world-capitalist system, the effects of capitalism on social formations in the metropole are quantitatively and even qualitatively different from the effects of capitalism on social formations in the periphery and semi-periphery. Thus, it is not possible to speak of the relationship between capitalism and technology in general; one must further specify the question. One must pose two questions; one question about the causal relationship between capitalism and technology in the metropolitan countries, and another question about the relationship between capitalism and technology in the peripheries. According to Hountondji, the form of capitalism that was introduced in the colonies (and specifically in African colonies) was a stunted form of capitalism that lacked the inner dynamism of capitalism as it existed in the metropolitan countries: "the capitalist mode of production was basically new with respect to the traditional one, but it was deprived of the industrial activity, the sense of initiative, the propensity to incur risk, that made this form of economic organization productive in the colonizer's own country" (Hountondji 1990, 9).[11] Hountondji is essentially claiming that the form of capitalism that was introduced in the peripheries (and specifically in African countries) was a dependent form of capitalism that lacked any internal dynamism, and that in fact, led to the slowing down of the rate of development of the productive forces. Hountondji argues that the scientific dependency which characterizes African countries today is essentially "a side-effect of economic domination, of forced integration into the world capitalist market, but within a subordinate sphere" (Hountondji 1990, 9).[12] Hountondji presents his claim as an application of Samir Amin's work on dependency to the sociology of scientific knowledge, as he admits in an interview with Franziska Dübgen and Stefan Skupien: "all my reflection and writings on scientific dependence owe much to my reading of Samir Amin" (Dübgen and Skupien 2019, 175).

We can see how Hountondji's argument can be reconstructed using the Hessen-Grossman thesis. First, there is the premise formulated by Boris Hessen, that "science develops out of production, and those social forms that become fetters upon the productive forces likewise become fetters upon science" (Hessen 2009 [1931], 87). The second premise is that colonialism was a "social form" that placed fetters upon the productive forces in the colonized social formations. This premise is derived from some versions of dependency theory. For example, the Nigerian political economist Claude Ake argued that while "there is no denying the fact that, in Western Europe, capitalism was a progressive force which has had a most revolutionary effect in transforming and expanding the forces of production", the same could not be said of capitalism in the peripheries (Ake 1978, 69). Capitalism as it was introduced in the colonies was essentially based on pillage, "colonial capitalism was more interested in external demand than internal demand; it was not interested in turning the primary products into manufactured goods in the colonies, and *thus the development of technology was inhibited*" [my emphasis] (Ake 1978, 70).[13] Amílcar Cabral also argued that, for the most part, capitalism has not accomplished in the colonies what it has accomplished in the metropolitan countries, i.e., "the speeding up of the process of development of the productive

[11] Under colonial French rule in West Africa, for example, a local African bourgeoisie was not allowed to develop. Entrepreneurial functions were instead allocated to Lebanese and Syrian immigrants (Arrighi 2002)
[12] Some critics of Hountondji completely neglect his engagement with dependency theory while at the same time implicitly drawing on it in formulating their critiques of Hountondji, e.g. (Ochieng 2010, 33-35).
[13] Walter Rodney also makes the same claim: "placing the whole question in historical perspective allows us to see that capitalism has always discouraged technological evolution in Africa" (Rodney 1982 [1972], 108).

forces and transformation in the direction of increasing complexity of the characteristics of the mode of production" (Cabral 1979, 127).[14]

The essential point that is while Marx and Engels may been right in thinking that capitalism, at a certain stage of its development, massively contributed to the development of the productive forces of metropolitan societies, and therefore to the development of science in so far as its development is dependent on the growth of the productive forces (i.e., the technological basis which was necessary for the emergence of modern science, as outlined by the Hessen-Grossman thesis), they were mistaken in thinking that this was a global phenomenon. For example, in their ode to the marvelous creative powers of the capitalist mode of production, *The Communist Manifesto*, they claim that: "the bourgeoisie during its rule of scarce one hundred years has created more massive and more colossal productive forces than have all preceding generations together" (Marx and Engels 1948, 13-14). They also argue that the bourgeoisie in its incessant search for markets, cheap labour power, and raw materials essentially "creates a world after its own image" (Marx and Engels 1948, 13).[15] For Hountondji (as well as Ake and Cabral), this is not exactly correct for what are created in the peripheries are extraverted economies as opposed to internally cohesive economies (such as those that were created in the metropolitan countries). Such economies can be described as disarticulated economies.[16] This created a situation where African economies in the colonial period (and neo-colonial period) were essentially responsive to external demands and not to internal needs. African economies are export-oriented and internally disarticulated (i.e., lacking complementarity between different sectors of their national economies, i.e., agricultural production does not serve the needs of industrial development in most African countries, insofar as agricultural production remains oriented towards the cultivation of cash crops for export): "our economies are rendered always responsive only to what the Western world is prepared to buy and sell, and hardly responsive to our internal development needs" (Babu 2002 [1971], 5). This pattern characterizes not only the colonial period but also the neo-colonial period (after formal juridical independence was attained). For example, in post-independence East African countries, the agriculture sector, insofar as it was geared towards the production of crops that could be exported, was articulated with the industrial sectors of Europe, the U.S., and Japan, and not with local industrial sectors (Nabudere 1981, 129).

In fact, the form of capitalism that was introduced to the African colonies not only provided little incentive for technological development, it even led to de-industrialization in some instances.[17]

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[14] A prominent feature of the discourse of the PAIGC, FRELIMO, and the MPLA was an understanding of liberation from colonialism as involving liberation from the "technological backwardness" that was, at least in part, induced by colonialism (Ferreira 1974, 24).

[15]But for an attempt to counter the charge of Eurocentrism that has been leveled at Marx by excavating his relatively unknown writings on the "non-Western world", see (Anderson 2010). For an attempt that focuses on Marx's scattered references to the African continent, see (Kalmring and Nowak 2017).

[16] However, for a critique of the claim that such disarticulation was unique to colonial economies, see the work of Sandra Halperin (2004; 2013). Halperin's basic contention is that all of the features which dependency theorists have identified as unique to the disarticulated economies of the "peripheries" obtained in the metropolitan "core" areas until the post-WWII period. However, Halperin's model also underemphasizes the significance of imperialism (El Nabolsy 2020c).

[17] This was especially true of the large concession companies of the Congo, which accumulated through systematic pillage: "Abir, the largest rubber concession company in the Congo Free State founded with Belgian and British capital, created no long-lasting entrepreneurial structures, introduced no new technology, no new market relations, no new indigenous elite" (Mavhunga 2013, 13).

Alexis B. A. Adande has argued that the collapse of primary metallurgy in West Africa can be attributed to both the Atlantic slave trade, which led to the decline of iron metallurgy in the Coast of Benin between the 17th and 18th centuries, as well to explicit colonial policies under formal colonialism (Adande 1997, 71).[18] The suppression of sodabi, an alcoholic drink that was made in various parts of Benin by distilling palm wine, by French colonial authorities during the 1930s is documented by Goudjinou P. Metinhoue (Metinhoue 1997, 60). It is of course true that in order to substantiate Hountondji's more general claim one needs to provide more empirical evidence, and while we cannot provide an account of de-industrialization across the African continent during the colonial period in this book,[19] we can point to a very well-studied example of the deindustrialization of an African country, namely the deindustrialization of Egypt during the 19th century (Amin 1978, 31, 1984, 2016; Al Sherbiny 2007, 28;Batou 1993; Al-Dāly 2007; Clawson 1981; Ayubi 1995, 99-108; Marlowe 1974, 81). In fact, after the British invasion of 1882, Sir Evelyn Baring (who later become known as Lord Cromer), made it very clear that British policy would be focused on ensuring that Egypt would be de-industrialized and maintained as an agricultural country: "the policy of the government may be summed up thus: 1)export of cotton to Europe subject to 1 percent export duty; 2) imports of textile products manufactured abroad subject to 8 percent import duty; nothing else enters into the government's intentions, *nor will it protect the Egyptian cotton industry*, because of the danger and evils that arise from such measures. . . *Since Egypt is by nature an agricultural country, it follows logically that industrial training could lead only to the neglect of agriculture while diverting the Egyptian from the land, and both these things would be disasters for the nation* [my emphasis]" (quoted from Abdel-Malek 1968, 7-8).[20]

The two main premises are as follows:

(1) First, there is the premise, derived from the Hessen-Grossman thesis, that social structures that impede the development of productive forces (i.e., technology) impede the development of science.

(2) The second premise is that the form of capitalism that was introduced in African social formations through colonialism impeded the development of productive forces (and in some cases led to de-industrialization). This premise is derived from some versions of dependency theory.

[18] The thesis that colonialism undermined the development of metallurgy in other parts of the African continent is also defended by Gloria Emeagwali and Edward Shiza (Emeagwali and Shiza 2016, 5). However, it is important to recognize that in other parts of the continent the decline of metallurgy was due to internal processes, for example, the decline of metallurgy in Kordofan in Sudan by the 18th century (Spaulding 2016, 204).

[19] Like Hountondji, other scholars have also argued that colonialism was responsible for the de-industrialization of the colonized social formations. Especially in relation to British rule in India (Beckert 2014, 134; Washbrook 1997, 435).

[20] Lord Lugard, perhaps the most well known British imperialist on the African continent, also advocated a similar policy of "cotton imperialism" in northern Nigeria: "he advocated crushing the local weaving industry so that cotton historically woven locally would be transported as raw cotton to England, and the redundant weavers would return to growing cotton" (Byfield 2002, 88). However, this policy was not carried out consistently, as subsequent colonial administrators took an opposing view.

From these two premises we arrive at the conclusion that colonialism was a "social form" that placed fetters upon the development of science in the colonized social formations.[21] We can thus observe the manner in which this argument is essentially the product of a synthesis between the Hessen-Grossman thesis and dependency theory. This synthesis is an innovation by Hountondji which was not been adequately discussed or even recognized as such by the Anglophone secondary literature on Hountondji. As noted in the beginning of this chapter, Hountondji never explicitly cites the Hessen-Grossman thesis, and to this extent it is important to recognize that this synthesis is, to a certain extent, unintended one on Hountondji's part. Yet, as I have argued above, it is the Hessen-Grossman thesis which allows us to reconstruct the most charitable and precise version of Hountondji's argument. Moreover, drawing on the Hessen-Grossman thesis, in this context, allows us to respond to critiques (often not well-placed) of dependency theory to the effect that it has no theoretical account of superstrucutral elements such as science.[22]

Finally, we should attempt to pre-empt one possible misinterpretation. One must distinguish between two claims. The first claim is that colonialism by slowing down the rate of development of the productive forces in African societies contributed to the technological and scientific gap between "Western" countries and African countries. The second claim, which is much stronger than the first, is that colonialism is *sufficient* to explain the technological and scientific gap between "Western" countries and African countries.[23] I interpret Hountondji as arguing for the first claim; for there is nothing in his writings that compels us to think that he is arguing for the second claim. Logically speaking there is no contradiction involved in holding that colonialism contributed to the widening of the technological and scientific gap between "Western" countries and African countries, while affirming that colonialism alone cannot account for this technological and scientific gap. For instance, one might adhere to the first claim, while also recognizing that the technological basis of agricultural production in most African societies was different from the technological basis of agricultural production in European societies (and Eurasian societies more generally). The plough formed the technological basis of agricultural production in the latter (from the Bronze Age onwards), while in the former (specifically in African societies south of the Sudan, with the exception of Ethiopia) the technological basis of agricultural production was the hoe (Goody 1971, 25-27).[24] Jack Goody also points to a technological gap in military equipment by the fifteenth century (Goody 1971, 28). The point is that one can concede all of this and still

[21] The classical Marxist move, e.g., in the work of J.D. Bernal, is to claim that capitalism places fetters on the development of science (Bernal 1937, 63). What the dependency perspective adds is an emphasis that this fettering effect is even more amplified in the colonial and neo-colonial context.

[22] An example of such a critique is found in (Nabudere 2011, 34). I think that most such critiques are misplaced in so far as they assume a monolithic entity which is the referent of the term of 'dependency theory', when in fact there was tremendous diversity amongst those who are labeled "dependency theorists ". Often, critiques like those of Nabudere are really just references to Andre Gunder Frank's work, which is then assumed (without argument) to stand for all of dependency theory. Moreover, we cannot neglect the fact that many dependency theorists were tremendously interested in the role of the superstructure in contributing to social revolutionary transformations and were deeply influenced by Maoist China's Cultural Revolution. These points were brought to my attention by Max Ajl.

[23] For an example of somebody who holds this claim we can point to Albert Mosley who argues that "instead of science making possible Europe's exploitation of other cultures, it is equally plausible that Europe's exploitation of non-Western cultures allowed them [i.e., Europeans] to develop the technological base we now attribute to science" (Mosley 2000, 29).

[24] Goody argues that this technological difference led to different forms of land tenure, which implies that it is not appropriate to use the concept of feudalism in analyzing African history (Goody 1971, 73).

maintain the claim that colonialism contributed to the widening of the technological and scientific gap between "Western" countries and African countries.[25]

[25] I remain agnostic with respect to the truth value of Goody's claims.