CAPITALISM IN THE AGE OF THE INTERNET

By G.Carchedi

York University

The Internet has given a new shape to modern capitalism. These new features have drawn the attention of numerous studies and have become the focus of highly topical and controversial questions. However, as a rule, the literature has not taken as its starting point the development of a Marxist epistemology. The reason is that this is perhaps the most underdeveloped area of Marxism, arguably the consequence of the failure to derive a Marxist theory of knowledge from Marx’s value theory. Differently from the literature, this is the task this article sets itself. From this perspective it analyses the changes in value production and in the generation of class knowledge brought about by the Internet. The Internet is then a case study testing and validating Marx’s value theory and theory of knowledge in contemporary capitalism.

The first section conceptualizes mental versus objective labour processes and rejects the notion of the non-materiality of knowledge. The second section builds on this conceptualization and deals with three interrelated questions, namely whether mental labour can be productive of value and surplus value and whether the distinctions on the one hand between productive and unproductive labour and on the other between production and consumption retain their validity in mental production. The third section explores the class nature of knowledge with particular reference to the Internet. Some final considerations follow in the last section.

**I. Some elements of a Marxist epistemology.**[[1]](#footnote-1) Consider labour. It is a transformative process, i.e. a sequence of transformations. They can be of two types. The *objective transformations* transform objective reality, reality that exists outside of our perception, even if we need to perceive it in order to transform it. More precisely,

(1) OT = (L -> MO, OO) = ON

where OT is objective transformations whose outcome is ON, the new objective use values, or output; L is labour power; MO are the objective means of objective transformations (e.g. a hammer); and OO are the objective objects of objective transformations (e.g. marble). The symbol -> indicates transformations.

In *mental transformations*, labour power transforms its own knowledge – and therefore itself - as well as the knowledge contained in objective reality (e.g. books, computers) into new knowledge

(2) MT = (L -> KL, KO) = KN

where MT is mental transformations whose outcome is new knowledge, KN. KL is the knowledge existing in labour power and KO is the knowledge contained in objective sources of knowledge (books, computers) outside KL. KL is both the mental means of mental transformations and one of the two mental objects of mental transformation (it transforms itself), the other one being KO. KL as one of inputs of a mental transformation is not the same as its output, KN because KN is the outcome of the combination of L, KL, and KO (the inputs). Since KN is immediately incorporated into KL, KN as the output of one MT becomes immediately the KL of the next mental transformation.[[2]](#footnote-2)

It would be mistaken to consider mental transformations as ‘immaterial’. Both objective and mental transformations are material. In fact, both require the expenditure of human energy, which is material, as shown by human metabolism. More specifically, the expenditure of human energy that constitutes the cognitive process, thinking, causes a change in the nervous system, in the interconnections between the neurons of the brain. This is called synapsis. It is these changes that make possible a different perception of the world. Knowledge, even if intangible, is material. To deny this means to ignore the results of neuroscience. After all, if electricity and its effects are material, why should the electrical activity of the brain and its effect (knowledge) not be material? There is no ‘immaterial’ labour, *pace* the workerist authors.[[3]](#footnote-3) But of course, while synapses make possible (changed) perceptions of the world, what is perceived is eminently social; it is the myriad of social relations and processes constituting a society. *Knowledge is always both material and social.*

Transformations are transformations of use values. In (1) the use values transformed are objective use values, MO and OO. In (2) the use value transformed are the *mental use values*, the use value of specific forms of knowledge, the use to which a form of knowledge lends itself. The mental use values transformed by labour power are KL and KO.

The distinction between the two types of transformations is only analytical because in reality objective transformations require mental transformations and vice versa. However, this distinction is necessary to conceptualize the labour process and thus labour.

A labour process is always the transformation of use values, *both* objective *and* mental. But it is *either* objective *or* mental according to which type of transformations is determinant. The relation of determinationrequires a detailed analysis. Here suffice it to mention that to be determinant means to be the *condition of existence* of the determined instance and to be determined means to be the *condition of reproduction or supersession* of the determinant instance. Then, the objective labour process is

(3) OLP = (OT => MT) = ON

where ON, the objective product, is the result of the objective labour process (OLP), the interaction of objective and mental transformations in which the former determine the latter. It is thus mistaken to think that objective labour, sometimes called physical or manual or material labour, is separated from mental activity.[[4]](#footnote-4)

In the mental labour process (MLP), the mental transformations that are determinant

(4) MLP = (MT => OT) = KN

where KN is new knowledge. KN has been considered to be the outcome only of mental transformations, as in (2) above, only as first approximation. In reality, KN is the outcome of a mental labour process that requires both mental and objective transformations. For example, the production of a videogame (MLP) requires an objective transformation, say the transformation of white paper into printed paper through a printer. The printer is an *objective means of objective transformations*. But within the context of a MLP, it is also an *objective means of mental transformations*, a condition for the (re)production of that form of knowledge, the videogame.

Three points follow. First, the knowledge as input of the MLP is not the output of that process.[[5]](#footnote-5) Second, new knowledge is not necessarily different knowledge. It is knowledge produced anew, even if it is a replica of an old one. Third, the key to distinguish an objective from a mental labour process is whether in general it is used for its objective (a shoe) or mental (a book) content.

**II. Value and the Internet.** The social determination of the Internet as a web of computers and as a technique of treating information is well known: the Cold War.[[6]](#footnote-6) Rather, the controversy hinges upon whether Marx’s value theory is still valid under modern conditions. Two preliminary points should be made.

First, within capitalism, the labour process (either mental or objective) is one of the two aspects of the *production process*, the other one being the *surplus value producing process,* or exploitation. This latter means that labourers must transform objective or mental use values for a time longer than that necessary for the production of their socially determined means of objective or mental consumption. Thus, a part of the working day must be used to produce objective or mental use values for the capitalists. To this end, labourers must be forced to deliver surplus labour by those agents who, as Marx says in Vol. III of Capital, perform the *function of capital* (or work of control and surveillance) without being capitalists, without being the owners of the means of objective or mental production.[[7]](#footnote-7) If labourers internalize the desirability to provide surplus labour, they internalize the function of capital. As we shall see, nowadays this latter option is more easily applicable to certain types of mental labour processes, especially on the Internet.

Second, in dealing with the Internet, we should distinguish between three categories of *mental producers,* those who above have been called, as a first approximation, mental labourers.

(a) The first consists of mental producers at the service of capital. They are the *mental labourers* proper.

(b) The second consists of those mental producers who use the Internet for profit without being capitalists. They are *mental self-employed*. They will not be dealt with here both because of reasons of space and because they are the debris originating from the collision between the two basic classes.

(c) The third consists of those mental producers who use the Internet for other purposes (for recreation, education, research, etc.) not at the service of capital but in their own free time. They are *mental agents***.**

The distinction between mental labourers and mental agents, between those employed by capital and those who are not, is essential to review the three questions debated in the literature.

**IIa.** The first question is *whether mental labourers on the Internet produce value.* Since value is labour expended under the capitalist production relation (by labour for capital), the production of knowledge (mental labour) can be productive of value and surplus value because it is mental labour performed for capital. In this case, the quantity of new value generated during the mental labour process is given by the length and intensity of the abstract mental labour performed, given the value of the labour power of the mental labourers. Exploitation, then, is the difference between the value of the mental labourers’ labour power and the value they generate. This value might be incorporated in an objective shell or not. In both cases it is an intangible but material commodity whose value is determined by the quantity of mental labour needed to produce it.[[8]](#footnote-8)

Besides these general features, mental production on the Internet has its own specificities, namely new labour processes, new positions, and new forms of exploitation. But these specificities do not cancel their capitalist nature. Let us take the example of a new labour process studied by Legault (2013, p.84): the production of videogames.[[9]](#footnote-9) Each video game is a unique piece, the technologies change rapidly, and the personnel is highly qualified. The development of each videogame is a project. The function of capital as brute external coercion, as in the Tayloristic assembly line, is ill suited for the control of a labour process based on the relatively spontaneous creativity of labour. New ways to control labour are necessary. The capitalists see to it that their labourers complete their tasks within the time allocated to them. Project managers monitor the developers’ progress and pay them when the project has reached some important points (milestones). But within these limits, labourers are free to take their own decisions. Labourers have internalized the function of capital. Therefore, control has changed semblance. But this neither cancels exploitation nor frees labour from capital.

Thus, the greater autonomy of these mental labourers is far from being absolute. Flexible and intellectually and emotionally rewarding labour hides long working hours (America on Line is called an electronic sweatshop), long and frequent hours of unpaid overtime work, (Legault, 2013, p.79) and the maximization of labour intensity (Pitts, 2013, p. 102). It is not only as Pitts aptly puts it, disciplined autonomy (Pitts, 2013, p.101). It is also creativity moulded by capital. Capital pays labourers to be creative, but this creativity must be consonant with capital’s aims and not with the labourers’ full and all-round development.

New divisions of tasks emerge. For example, some of the labourers working for search engines analyse blogs, both quantitatively in terms of the number of visitors, and qualitatively in terms of the comments left by the visitors and thus in terms of their ideas, preferences, etc. Other labourers navigate the web looking for ideas helpful for advertising campaigns, for example by analysing chat lines. Still others transform this material in knowledge as commodity to be sold to advertising agencies. Capital stamps the structure of the labour process by creating a bureaucratic hierarchy that includes more as well as less qualified tasks.

Some commentators have emphasized another aspect: the blurring of the frontier between working time and private life. For example, labourers solve ‘creative problems’ regarding their jobs in their free time (Pitts, 2013, p. 95). Or, labourers can answer e-mails or keep their correspondence with bloggers from home, also in their free time. This is not exploitation. If capital is a relation of production, this relation is suspended in the labourer’s free time and resumed when the labourers return to their work. During this time, labourers are not exploited. The e-mails that a mental labourer answers from home in her free time, say in one hour, count as if they had been answered during her working time. But the time during which she works for capital, say eight hours a day remains the same. However, when the moment she returns to her work, her labour becomes more productive. It is as if in the first instant of her work she had answered those emails. Her productivity has risen but the surplus value she produces is still that produced in eight hours of work. This calls for a discussion of productivity in mental labour and for the relation between increased productivity and increased profitability.

Critics hold that the productivity of mental production cannot be measured because allegedly it is ‘immaterial’. Knowledge, supposedly, “resists quantification” (Terranova, 2000, p. 43). Now, in objective production productivity is measured as units of output per unit of capital invested. This holds also for mental production, say, a videogame. The mental product can be contained in an objective shell (a DVD). The DVDs produced can be counted. But it can also be downloaded from one computer into another. The number of downloads can also be counted. In short, the mental output can be counted. This is the numerator. The capital invested, the denominator, can be computed as well.

First of all the capital invested in the prototype. This is not only fixed constant capital (computers, premises, facilities, chips foundries, assembly plants, etc.). It is also circulating constant capital (raw materials) and variable capital, wages, which go from very high (for highly qualifies developers) to low. Then there are the costs of administration, of pre-sale advertising, and other costs. Let us call all these costs (a).

The other element is the additional capital invested in the production of the replicas of the prototype. It is the additional costs of type (a) plus the variable and constant capital needed for the production and delivery of the objective shell of the mental product (e.g. DVD’s) during the whole life cycle of the MLP. Let us call these costs (b). The total capital invested is thus (a) plus (b). Productivity in mental production can be computed.

Another related myth is that the unit value of the copies is or tends (practically) to zero. In reality, the *total* value of the replicas can be high. It is given by (a) plus (b), plus (c), i.e. the surplus value generated during the whole life cycle of the MLP. The *unit* value is then given by the total value divided by the number of replicas made. It is directly proportional to the total value and inversely proportional to the quantity of the replicas.

The size of the output is variable. It depends on the technology used. Its limit is obsolescence, a point reached when, due to intense competition, the demand for it falls to the point at which it is not profitable any longer to produce it. In the videogame sector, this causes a “high rate of business failures” (Dyer-Witheford and de Peute, 2009, p. 64). If production stops when the receipts are less than the capital invested a loss is suffered. If production continues after that point, the profits made are the realization of the surplus value produced. If production continues further, the increased profitability derives from appropriation rather than production of surplus value. Then,

the value o the replicas cannot be or tend towards zero because the costs of type (b) are constant and do not decrease as the mass of output increases, *pace* the costless reproducibility of the workersist ‘cognitive commodity’.[[10]](#footnote-10) As far as costs of type (a) are concerned, the higher the productivity, the lower the unit value but the higher the extra surplus value appropriated.

What alternatives do the critics of this submit? Let us take a sample. For Jodi Dean (2010), “Just as industrial capitalism relied on the exploitation of labor, so does communicative capitalism rely on the exploitation of communication”. There are two problems here. First, different use values can be aggregated because they have one element in common, abstract labour. What is the common element that makes the aggregation of different types of information possible? Second, information is knowledge and knowledge is the product of mental labour. Thus the exploitation of information is simply the exploitation of (abstract) mental labour.

For Arvidsson e Colleoni (2012), Marx’s value theory is not applicable to the Internet. For the authors, value is the affective attachment to a commodity, to a brand. Presumably, the greater the number of customers attached to a brand (and thus buying that product), the greater its value. This is the view of the capitalists who aim at maximizing their share of the market by manipulating demand, i.e. by influencing the redistribution of value. It does not reflect the view of labour whose basic interest lies in discovering the source of value and thus of surplus value before it is redistributed. The authors should explain how the (dis)accumulation of affective investments can explain, say, economic crises.

The above calls for some short remarks on the so-called affective labour, i.e. labour that produces or manipulates affects (wrongly referred to as immaterial labour). Here I am not referring to housework, which is not performed for capital and thus deserves a separate analysis. Rather, Autonomist authors refer to advertising, care work, flight attendants, fast food workers, etc. All these categories can be easily accommodated within the law of value. Advertising is an example of unproductive mental labour. Care work is an example of objective productive labour because it preserves and reconstitutes the commodity labour power (which is material). Flight attendants are an element of transportation (which for Marx is both objective and productive of value) and thus their labour is both objective and productive. And fast food workers are also part of an objective productive labour whose product is sold to fast food customers for profit. As for friendly sales attendants whose sales figures are better than those of their less friendly colleagues, they are more skilled and thus more productive. Their labour power has thus a higher value. But they do not produce value.

**IIb**. The *second question* concerns whether the distinction between productive and unproductive labour is still valid in mental production and especially on the Internet.

Let us first consider objective labour. For Marx, if immersed in the capitalist production relation, it is productive if it transforms use values into new use values. It is thus unproductive in the following four cases. First, labour employed in commerce. As Marx argues, while productive labour transforms objective use values, unproductive labour deals with them without transforming them. If one exchanges objective use values, one cannot transform them. Second, labour employed in finance and speculation because it does not deal at all with objective use values. Third, as Marx explains in Volume III of *Capital*, the ‘labour’ of those who perform the work of control, the function of capital. They can be called ‘non-labourers’. The fact that they are necessary for the capitalist production process does not make them productive of value. In complex labour processes, the function of capital is performed by a hierarchical structure going from the CEOs to first line supervisors. They cannot produce value because one cannot transform use values if one forces others to perform that transformation.[[11]](#footnote-11) Finally, the labour that destroys objective use values cannot be productive of value because it destroys the specific form (use values) in which value is contained.

Similarly, the production of knowledge is productive of value because it transforms mental use values. But on the basis of the analysis above, it is not productive of value if it theorizes (a) the exchange of objective use values; (b) financing and speculation; (c) the performance of the function of capital; and (d) the destruction of objective use values.[[12]](#footnote-12) The question is not whether the generation of knowledge *tout court* is productive or not.[[13]](#footnote-13) The question is when it is and when it is not. The problem lies in the limitations of the official data. The distinction between productive and unproductive mental labourers holds also if they operate through the Internet.

Consider now the *mental agents.*[[14]](#footnote-14) They too are unproductive, but for a different reason, because they are not employed by capital. Consider, for example, the ‘social buttons’ in Facebook. The mental agents who press social buttons, or who discuss a variety of issues on blogs, or who develop technological innovations through their interaction, transform mental use values. At the same time, they provide knowledge to whoever is interested in it. This knowledge is for free, not because it costs nothing (think of the wear and tear of the computer, of the energy consumed, etc.) but because anybody can appropriate it free of charge. On the Internet, this is what the search engines, a specific form of capitalist mental production, do through their mental labourers.[[15]](#footnote-15) They transform this knowledge into marketable knowledge, i.e. they quantify data on tastes, desires, interests, etc. Then they sell these data to other capitalists who use it to plan advertising campaigns and investments, to evaluate the credit-worthiness of clients, etc. Those capitals that are more skilful in appropriating the knowledge generated by the mental users can increase their profitability. This is a new form of inter-capitalist competition that will probably increase in importance in the years to come.

Or consider the case of mental agents contributing voluntarily to open source (OS) projects through the Internet. If they are not employed by capital they are unproductive. They enjoy great freedom to apply their creativity. However, the individual contributions require coordination and thus a more or less formal organization. This coordination is the task of the project initiator or of those programmers with particular skills and commitment to the project. They decide which contributions to accept and give form and direction to the project (Ross, 2013, p. 214, Riehle, 2007, p.30). Wikipedia and Linux are two examples (Kostakis, 2010).

The coordinators are often employed by IT firms.[[16]](#footnote-16) These coordinators are unproductive because, even if they are paid by capital, they participate in an unproductive MLP. This apparent paradox is explained by a series of advantages accruing to the firms ‘lending’ labourers to this common project. First, that firm can accept only those contributions that fit its techniques and interests. Second, it pays only a fraction of the total costs (West and Gallangher, 2006, p.329) while appropriating the whole technology. Third, it reckons that its advantages from such technologies are greater then those accruing to its competitors. Fourth, by observing through its mental labourers how the mental agents can be controlled and managed, that firm can draw useful indications as to how to control and manage its own labourers.

Some authors (Fuchs, 2010) deny that the mental agents are unproductive and, following in the footsteps of Negri, extend the notion of exploitation beyond waged labour and into the whole of society. Supposedly, surplus value is increasingly created in the sphere of reproduction and consumption. All life, then, becomes the source of surplus value. These authors overlook that the condition for the production of surplus value is not its actual generation. Since all labour is a condition for the reproduction of capital and thus for the production of surplus value, all labour would be productive and capital would exploit all members of society, including the users of the Internet (op.cit. p. 188). But then, one can equally hold that, directly or indirectly, all labour is a condition for the destruction of capital (crises, wars, etc.) so that all labour is destruction of capital. Moreover, if all labour is productive, why should capital try to increase the time that labourers work for it and reduce the labourers’ free time?

Fuchs holds also that, given that the users (mental agents) are not paid for the production of value, the value of their labour power is nil. Thus, all the value produced by them is surplus value that goes to capital. The rate of surplus value is infinite (ibid.). But then, how can something that has no value (labour power) produce value and surplus value? Also, if all value were surplus value, the users would have to live on air.[[17]](#footnote-17)

In reality, capital pays labourers for supplying labour for, say, eight hours per day. If the rate of exploitation is 100%, four hours are necessary to produce the wage goods (and thus to reconstitute the labour force for 24 hours) and 4 hours are surplus labour producing surplus product and thus surplus value. The reconstitution of the labour power implies also recreation activities, including those on the Internet for, say, one hour a day. The same person who is a mental labourer for eight hours is a mental agent on the Internet for one hour. Since the mental agent does not work for capital, she is not exploited and does not produce value and surplus value. The question of the mental agent’s rate of exploitation is thus meaningless. That mental agent is exploited not as such but as a mental labourer.

**IIc.** The third and final question concerns the *distinction between production and consumption* that the Internet would have made obsolete. The argument rests on a new figure, the so-called *prosumer***.**[[18]](#footnote-18) This term refers to a mental agent whose production of knowledge co-determines the characteristics of an objective commodity that she commissions through the Internet and that she then purchases and consumes. However, it is one thing to argue that the same person is both a producer of a mental use value and consumer of an objective output; another is to draw the conclusion that the distinction between production and consumption has disappeared.

The knowledge produced by that mental agent is a mental *use value* that enters into and shapes the capitalist’s objective labour and production process. That mental agent participates in the design of the MLP but does not participate in the production of value and surplus value because she is not employed by capital. The mental agent’s consumption of the output of the capitalist production process follows *temporally* its production. The *present* mental producer (agent) is the *future* consumer. When the future consumer specifies to the capitalist the characteristics of that commodity, she is an unproductive mental producer. When she purchases and consumes that commodity she is a consumer. The two *phases* are temporally distinct even if the same *person* might be a mental producer today and an objective consumer tomorrow. The prosumption thesis errs in that it cancels time.

The above is not to deny that ‘users’, i.e. mental agents, are the source of innovations in many fields (Lakhani and Wolf, 2005; Banks and Deuze, 2009; Prahalad and Ramaswamy, 2000). But behind the hype, the truth of the matter is that the mental agents are a new source of “competence” for the corporations (Prahalad and Ramaswamy, 2000). An example is *modding*, the modifications of videogames by the consumers (mental agents) using the tools provided by the games’ manufacturers. They are “an increasingly important source of value for the games industry” (Küklich, 2005). The character behind the Janus face of the prosumer is not the empowered consumer but capital with its new techniques to increase efficiency, sales, and profitability at no cost.[[19]](#footnote-19) The idea that this new technology might replace mass production should be taken with a good dose of skepticism given that the future consumer usually brings only (marginal) modifications to mass produced commodities. “In 2011 … the Internet economy only contribute[d] 3.8% of the GDP of the EU27” (Pfeiffer, 2013, p.15).

**3. Class knowledge and the Internet.** The essence of capitalism is the contradiction between two fundamental classes, the owners and the non-owners of the means of production, and thus between the generators and the appropriators of surplus value. This contradiction emerges also at the level of knowledge. The appropriation of surplus value requires a view of reality that rationalizes exploitation, inequality, and egoism. This is *capital’s rationality*. Labour, to rid itself of capital’s yoke, must express the opposite rationality: *labour’s rationality* must be based on co-operation, solidarity, and equality. The capitalists, to be such, must secrete a variety of forms of knowledge whose common feature is that of being moulded by capital’s rationality. The labourers, to resist capital’s rule, must generate forms of knowledge with an opposite class content.

This cognitive antagonism strikes its roots in the two fundamental classes and spreads to and imbues the immense variety of individual forms of knowledge. Each individual internalizes the conflicting rationalities in his/her own way, thus giving rise to a kaleidoscope of forms of individual knowledge. Given that they have an antagonistic class character, the knowledge individuals internalize is usually internally contradictory. Both rationalities co-exist in conflicting ways within each individual’s knowledge. But only one of these two rationalities is usually dominant. There is no cognitive neutral space.

Individual forms of knowledge aggregate into forms of social knowledge. Social knowledge is not the summation of individual forms of knowledge because the latter are by definition different and thus cannot be added. There must be a common element that makes possible that aggregation. This is the class content of the individual forms of knowledge.[[20]](#footnote-20) This is why social groups and social forms of knowledge can reproduce themselves independently of which specific individuals, and thus of which specific features of individual forms of consciousness, share that class content.[[21]](#footnote-21)

The aggregation of individual forms of knowledge needs aggregating agents who, following Gramsci, are here called *organic intellectuals*.[[22]](#footnote-22) The organic intellectuals transform the variety of the specific individual forms of knowledge of the members of a group into their own view. Their representations become their individual, personal interpretation of a collective knowledge; they become the specific forms of a generality. The organic intellectuals and those they represent form the *collective intellect* of that group, the collective subjectivity, or knowledge, of that group.[[23]](#footnote-23) Given the constant interaction between the organic intellectual and the other members of that group, the collective knowledge of that group is the product of the collective intellect and not only of the organic intellectuals. The organic intellectuals contribute and give a unified shape to that collective knowledge.[[24]](#footnote-24)

Within a group there can emerge more than one organic intellectual. Each has a different interpretation of that group’s knowledge and each view vies to become dominant. Also, within a group there might be sub-groups. Each can be represented by one or more organic intellectuals who operate at a lower level of aggregating capacity. Thus the collective intellect of a group can result from the interaction of the collective intellects of the several sub-groups. But this is not all. The organic intellectual of a group interacts with the general intellect and thus with the organic intellectuals of other groups. An organic intellectual can interiorize elements of a collective knowledge from a different class perspective until the original collective knowledge undergoes a radical change. The continuous struggle between these two rationalities to become dominant within *each and all* forms of knowledge is the *cognitive* *class struggle*, class struggle as production of knowledge.

We can now see that when individuals internalize forms of knowledge, they internalize also forms of social knowledge. Through their internalization by individuals, those forms of social knowledge are reduced again to individual forms of knowledge, which are again transformed into new forms of social knowledge through the emergence of a collective intellect. Individual knowledge is aggregated into social knowledge and the latter is reduced again to individual knowledge through the individuals’ internalization. Theories focussing on individual needs, preferences, choices, etc. as a platform for a theory of class consciousness are mistaken and actually deleterious.[[25]](#footnote-25)

As far as labour is concerned, this means that the defence and fostering of labour’s rationality can assume different forms according to who becomes its intellectual representatives and that the capacity of its collective intellects to ward off capitals’ rationality depends not only on the collective intellect’s intellectual capacities but also, and mainly, on the interrelation among the multifarious forms of manifestation of all societal relations and processes both expressing and influencing the class struggle (e.g. the upwards or downwards long-terms economic phase, the political power relations, the nature of labour’s institutions and organizations from the smallest to the biggest, like the trade unions, etc.) and thus on the knowledge of that struggle’s nature.

The thesis that knowledge is not socially neutral but that it has a class content is rejected even by numerous Marxists, certainly if it comes to natural sciences. It is the use of knowledge, it is held, and not its nature that is socially determined. But if people internalize class contents, the knowledge they express must also have a social, class content. This is sufficient to cast doubts on the thesis of the class neutrality of knowledge. But in order to argue for the opposite thesis, a number of clarifications are needed.

If we apply the notion of the class content of knowledge to the analysis of the MLP as in section I above, the class content of knowledge as an output of a MLP is determined by the class content of the knowledge (mental inputs) that goes into its generation. Then the analysis of how the social content of the output derives from the social content of the inputs implies the analysis of the social content of inputs. Since the input of one period is the output of the previous period, don’t we fall into the backwards *ad infinitum* trap?

Let us choose a point of departure, for example time t1 as the end point of the period t0-t1. This period produces new knowledge, call it KN(t1).[[26]](#footnote-26) At t1 we can analyse the social content of KN(t1) but not that of its mental input, the knowledge contained at t0 in labour power, i.e. KL(t0). The next production period, t1-t2, produces KN(t2). Its input is KN(t1), the outputs of the previous period, the social content of which is known. Since the output of a period becomes the input of the following period, KN(t1) as output of t0-t1 is at the same time KL(t1) the input of t21-t2. Then we can analyse how KL(t1) determines the social content of KN(t2). From t2 on, we can follow how the social contents of the mental inputs determine the social content of the newly generated knowledge.[[27]](#footnote-27)

On the basis of the above, let us consider one of the critics’ favourite charge, i.e. that 2+2 is always equal to 4. Then, given that the social content changes and given that 2+2 = 4 is immutable, 2+2 = 4 could not have a social content. But first of all, 2+2 is *not* always equal to 4. It all depends on what we want to measure and on how we want to measure it. For example, our system of recording the time of the day goes from 0 to 23, 24=0 and 24+2 is not 26 but 2. In mathematics this is expressed as 26≡2, *modulo* 24. Or consider clocks that use the numerals 0 to 12. Then , 12 = 0 and 10+6 = 4. Or consider a numerical system going from 0 to 4. Then 4=0 and 2+2 ≡ 0, *modulo* 4. But once we choose a *modulo*, e.g. *modulo* 24, 2+2 is always equal to 4. What is then its social content?

A social knowledge, a form of knowledge shared by a number of people, must satisfy a social need, for example the protection of a group’s interests. A social need can be expressed either from the perspective of labour’s rationality of capital’s rationality.[[28]](#footnote-28) Originally, this form of knowledge can be the outcome of an individual conception. But if it does not satisfy a social need, it is socially useless and does not mutate into the outcome of the collective intellect’s theorisation. It is thus ignored by that group or by society. Thus a *social knowledge has by definition a social content*, the common need it satisfies. What about mathematics? The social need satisfied by mathematics, and thus its social content, is that it can quantify by abstracting from the specific features of what is quantified. But it is not an immutable need, as usually thought. It arises only at a certain level of development of the productive forces. The following example should clarify this point.[[29]](#footnote-29)

For the ancient Greeks, the world was a well-ordered arrangement of concrete things. The order of numbers was a succession of discrete entities. It was then natural to conceive of numbers as *numbers of some things*, as discrete, concrete numbers that could be ordered and counted. Given their discrete nature, numbers could be represented as dots and thus ordered in triangular, square, or other shapes. Accordingly, the Greeks developed the notion of shaped numbers (for example, triangular). Numbers had visible and tangible bodies. Moreover, since numbers could be ordered, their position revealed their being and nature, things had arithmetical properties, and these properties concerned the being of things. The classification of numbers was then a means to grasp the meaning of life. An abstract idea of numbers was incompatible with the ancient Greeks’ ontology.

With the advent of capitalism, numbers came to perform a new function by indicating the property of moving, active processes of change. This required the search for general relations, which, in turn, required that numbers had to become abstract numbers, separated from the things they measure. This implies that numbers be likened to a continuous straight line of homogeneous entities, rather than to a succession of discontinuous and heterogeneous dots. The notion of numbers survived the advent of capitalism only because it could become an element of a view of reality with a mutated social, class content.

Let us now return to 2+2 = 4. It had been developed before capitalism. Ancient civilizations did not conceive of numbers greater than 2. They used expressions such as ‘many people’. Numerical systems, and thus presumably 2+2 = 4, were determined by the emergence of exchange and commerce.[[30]](#footnote-30) This is its original social determination. Its social content is that from a certain point of the development of the human race it shared with mathematics the need to quantify irrespective of what is being measured. It is a *trans-epochal* element of knowledge because on the one hand its original social content does not change through epochs, because the need to quantify abstractly arises in different (but not all) epochs and societies. On the other hand, this social content changes because the specific reasons for abstract quantification change according to the different historical and social settings. This *general* social content becomes *specific* in different epochs and societies.

But mathematics is also a *trans-class* element of knowledge because all classes in capitalism need mathematics to express their rationality. Only this class content does not become visible if removed from a specific social context. The class content of mathematic and thus of 2+2 = 4 can become visible only if immersed in a MLP *in the realm of social reality* and thus in the class content of the MLP of which it has become an element. The general need to quantify abstractly becomes specific, it acquires a specific class content. This holds also each time it is proved that 2+2 = 4. Its specific social content derives from the MLP in the realm of social reality in which that proof is immersed, for example in school teaching. In short, mathematics can be used in different epochs and by different classes not because it is socially neutral but precisely because of its social determination and content.

The above has dealt with the production of knowledge in general under capitalism. Consider now the specific example of MLPs carried out by mental labourers at the service of capital. The former must transform existing knowledge into new knowledge with means of mental production owned by capital. What does this mean? The capitalists own *the objective means of objective transformations*, e.g. premises, computers, etc. Within the context of a MLP, they are also the *objective means of mental transformations* (see section I above). Thus the capitalists own the mental labourers’ labour power. Consequently, the capitalists can decide which knowledge should be produced, how it should be produced, and for whom. Or, they have the power to define and solve problems for their own goals. It is in this sense that they own the *mental means of mental transformations* (KL in relation 2 above). The knowledge their mental labourers produce must be informed by capital’s rationality and not by labour’s rationality.[[31]](#footnote-31) This is cognitive class struggle. Labour’s false consciousness is not a distorted reflection of reality but the acceptance by labour of capital’s rationality.

Usually, the capitalists do not have the competence needed to organize and manage a MLP. This is the task of the collective intellect at their service. Within it, the organic intellectuals plan the structure of the MLP and formulate the tasks of the rest of the collective intellect and thus the structure of the MLP. This structure is fragmented in such a way that the collective intellect cannot reconstruct the overall view of the labour process. The structure of the production of knowledge by labour under capitalism is thus an instrument of labour’s domination by capital. This is the hierarchical structure analysed first by Marx and in more recent times by the Braverman debate. But there is also a different form of labour process, a MLP in which the mental labourers are free to express their creativity subject to the ultimate approval and coordination of an agent of capital, e.g. a coordinator. The hierarchy is reduced to a minimum, but it is still there to ensure that those labourers produce surplus value. To this end, the organic intellectuals must have internalized the aims of capital and must have made them their own.

There is a feature specific to the production of knowledge under the rule of capital. In objective production, capital appropriates the surplus product (value) and nothing remains to labour. In mental production, capital owns the means of mental production and thus it appropriates the outcome of that process.[[32]](#footnote-32) But that knowledge is also retained by the collective intellect. Capital appropriates the original, as it were, and the copy remains to labour. Then, the collective intellect can use the copy of the knowledge it produces for its own purposes, and thus also to resist the rule of capital.

However, capital’s rationality predominates over labour’s rationality because that knowledge has ben produced by mental labourers with capital’s means of mental production. Labour can use to resist capital’s rule but that resistance remains within the contours of capital’s rule. For example, the rhythm of the assembly line can only be slowed down. Or the use of a gun both by capital and by labour is not due to the class neutrality of the knowledge needed for its production but to its double class determination.[[33]](#footnote-33) Or take the knowledge needed for cooperation within a team of workers. The rules are not those that maximize the development of the workers’ potentialities or the power to challenge capital’s domination but those that increment productivity and thus profitability. Solidarity as viewed by labour has been transformed into a weapon of capitalist domination. Pharmaceutical firms produce not those medicines that maximize human wellbeing but those that maximize profits.

Let us finally come to the production of knowledge on the Internet. If it is produced by mental labourers, the analysis above applies. This explains the pro-capital knowledge inherent, for example, in video games.[[34]](#footnote-34) If it is produced by mental agents, since it is not produced within the capitalist (mental production) relation, it can have a contradictory social content in which labour’s rationality can (but does not necessarily) predominate. This knowledge then can be used to resist capital’s rule. This is the real importance of the Internet.

Here too the thesis of the non-neutrality of knowledge is disputed. For example, Stalder (2013, p. 30) submits that “commons are not capitalist, but also not anti-capitalist. They are, first and foremost, a-capitalist. A tenuous position.” But essentially there is nothing new about non-hierarchical processes of production of knowledge on the basis of solidarity. This has been a feature of capitalism ever since capitalism came into existence for the simple reason that there is no capitalist rule without resistance against it and thus without the production of pro-labour knowledge as a weapon against that rule. The difference is the extensive and intensive use of the Internet and thus the new and specific contradictory forms of knowledge.

The production of knowledge by only a few mental agents can have initially a limited impact because it is the outcome of the interrelation between only a few persons. However, it would be mistaken to underestimate its importance. Those mental agents interact also with the rest of society and their knowledge interacts with the myriads of all other individual and social forms of knowledge. This limited production of knowledge is thus a condition for the emergence of broader pro-capital or pro-labour forms of knowledge. Its possibly initially relatively modest impact is thus amplified. The generation of knowledge on the Internet is a battle for knowledge. It is part of the wider cognitive class struggle, between capital’s and labour’s rationality in its multifarious and ever changing forms of manifestation.

**4. The delusions of ‘cognitive capitalism’.** The apologetic analyses of the Internet are strictly connected to the notion of information society and cognitive capitalism. These are highly ideological concepts. The usual meaning of information is that it is communication of *operational* knowledge. In this view, information has no class content. This notion reflects and reproduces the myth of the class neutrality of knowledge. This is why the term knowledge has been used rather than information. The concept of cognitive society is equally ideological. As Henninger (2007, p. 173) points out, the cognitive society imagery is the way “certain relatively privileged sectors of the world’s working population” perceive contemporary capitalism. Even if, for the sake of argument, all objective labour processes were to disappear worldwide and only mental labourers were left, the old and debilitating features of capitalism would re-emerge, even if in new guise. The above has considered some examples.

On the Internet some mental labourers, e.g. some programmers in IT firms, can and must use their creativity to solve conceptual problems. This is a psychologically rewarding activity, often well paid. However, far from being a prefiguration of the working class of the future, they could be considered to be a new form of labour aristocracy. As such, in spite of their privileges, they are subjected to the rule of capital. They must apply their creativity (highly-skilled labour) also in their (mostly unpaid) free time. The skills they are under pressure to develop are those that can be used by capital, i.e. their conceptions are informed by capital’s rationality. These skills are subjected to tendential dequalification. Their employment is subjected to the ebb-flow of the economic cycle. And their rate of exploitation can be even higher than that in many objective production processes (whether they are aware of it or not).

Also the knowledge generated by mental agents can be shaped by capitalist rationality. This is the case of OS projects which rest on the contribution of a number of mental agents. A large number of them aims at being hired by capital. The skills they develop must then be suited to the needs of capital. The freedom of their creativity and their much-touted ‘playbor’ are thus constrained (Phoebe and Taylor, 2009). But inasmuch as their mental production is not influenced by capital’s rationality, they can generate a type of knowledge whose class content is alternative to that of capital. An example is provided by the thirteen-minutes political documentary *The French Democracy* on the uprising by immigrant youth in 2005 in the suburbs of Paris. This video “made for a cost of some $60, was downloaded many times, for free, was uploaded to YouTube, drew widespread press attention, and was shown at film festivals, making it perhaps the single most effective communiqué from the *banlieux* to leap across the Atlantic and around the world.” (Dyer-Witheford and de Peute 2009, p. 187).

The case studies reviewed in this work have highlighted specific novelties. Those novelties are the new bottles containing old wine, capitalism and its double, contradictory rationality. This thesis is further and definitely supported if we look at the wider picture. In the words of *The Economist*, “the prosperity unleashed by the digital revolution has gone overwhelmingly to the owners of capital and the highest-skilled workers. Over the past three decades, labour’s share of output has shrunk globally from 64% to 59%. Meanwhile, the share of income going to the top 1% in America has risen from around 9% in the 1970s to 22% today. Unemployment is at alarming levels in much of the rich world, and not just for cyclical reasons. In 2000, 65% of working-age Americans were in work; since then the proportion has fallen, during good years as well as bad, to the current level of 59%” (2014). This is exactly what Marx would have predicted. What *The Economist* forgets to mention is that in the last thirty years cognitive capitalism has been tested by a series of crises, one worst than the other. And that after 15 years of the explosive growth of the Internet known as Web 2.0, the world economy has never been in such a bad shape since the 1929-33 crisis. Marx would have predicted this too because, contrary to workerist cognitive capitalism, he has a theory of crisis.

Contemporary sociological literature has generated a host of examples of how the mental agents’ interaction through the Internet and the forms of knowledge springing from this interaction provide glimpses of a social structure based on labour’s rationality as well as specific forms of resistance against capital’s rule. But it would be a dangerous illusion to think that a simple multiplication of these attempts can lead to a radical societal change if the capitalist production relation is not thrown into the dustbin of history. The Internet does not cancel the divide between capital and labour and thus does not change the law of value. The Internet only provides a specific global arena for knowledge and reshapes the multitude of the cognitive forms of manifestation of the capital/labour contradiction. To analyse them, one need not discard Marx’s value theory. It is sufficient to apply it.

**Bibliography.**

Adam Arvidsson, A. and Colleoni, E. (2012), Value in informational capitalism and on the Internet. *The Information Society,* 28 (3): 135-150.

Banks, John A. and Deuze, Mark (2009) *Co-creative labour.* International Journal of Cultural Studies, 12(5). pp. 4194-431

Carchedi, G. (1977), *On The Economic Identification Of Social Classes*, Routledge and Kegan Paul, London.

Carchedi, G. (1984), The Logic of Prices As Values, *Economy and Society*, 1984, Vol. 13, No.4, pp. 431‑455

Carchedi, G. (1989), Classes and Class Analysis, in E.O.Wright, The debate on Classes, Verso

Carchedi, G. (2001), *For Another Europe. A Class Analysis of European Economic Integration*, Verso, London, April 2001

Carchedi, G. (2005), On the production of Knowledge, *Research in Political Economy*, 22, 267–304.

Carchedi, G. (2012), *Behind the Crisis*, Haymarket, Chicago

Dean, J. 2010, *Blog Theory,* Polity Press

Dyer-Witheford, N. and de Peute, G. (2009), *Games of Empire*, University of Minnesota Press Minneapolis / London

Denton, P.H. and Restivo, S. (2008), *Battleground Science and Technology*, Greenwood

Henninger, M. (2007), Doing the Math: Reflections on the Alleged Obsolescence of the Law of Value under Post-Fordism, *Ephemera*, volume 7(1): 158-177

Kostakis, V. (2010), Identifying and understanding the problems of Wikipedia’s peer governance. The case of inclusionists versu deletionists, *First Monday*, Vol. 15, No. 3, file:///Users/carchedi/Documents/mac%20current/Peer%20governance%20and%20Wikipedia:%20Identifying%20and%20understanding%20the%20problems%20of%20Wikipedia’s%20governance%20.webarchive

Kostakis, V. (2012), The political economy of information production in the Social Web: chances for reflection on our institutional design, *Contemporary Social Science*, First, pp. 1–15, http://p2plab.gr/wp-content/uploads/2013/05/CSS\_Kostakis.pdf

Küklich, (2005). Precarious Playbour: Modders and the Digital Games Industry, *The Fibreculture Journal*, issue 5.

Lakhani, K.R. and Wolf, R.G. (2005), Why Hackers Do What They Do: Understanding Motivation and Effort in Free/Open Source Software Projects, in Feller, J. et al. (ed.), *Perspectives on free and open source software*, The MIT Press

Legault, M-J. (2013), IT firms working time (de)regulation model: a by-product of risk management strategy and project-based work management, *Work organization, Labour and Gobalization*, Volume 7, Number 1, Summer 2013, pp. 76-94

Lovink, G. (2011), *Ossessioni collettive*, Università Bocconi Editore, Milano

Marx, K. (1967), *Capital*, Volume III, New York: International Publishers.

Pfeiffer, S.(2013), Web, value and labour, *Work organisation, labour & globalization*, Volume 7, Number 1, pp. 12-30

Pitts, F. (2013), ‘A science to it’: flexible time and flexible subjectivity in the digital workplace, *Work organisation, labour & globalization*, Volume 7, Number1

Prahalad, C.K. and Ramaswamy, V. (2000), Co-opting Customer Competence, *Harvard Business Review*, January

Rey P.J. ( 2012), “Alienation, Exploitation, and Social Media.” *American Behavioral Scientist*, 56:4, 399–420.

Reveley, J. (2013), The exploitative Web: Misuses of Marx in critical social Media studies, *Science & Society*, Vol. 77, No. 4, 512–535.

Riehle, D. (2007), The Economic Motivation of Open Source Software: Stakeholder Perspectives, IEEE Computer Society, pp. 25-32.

Ross, D (2013), The place of free and open source software in the social apparatus of accumulation, Science and Society, Bo. 77, No. 2, pp. 202-226

Starosta, G. (2012), Cognitive commodities and the value form, *Science & Society*, Vol. 76, 365–392

Stalder, F. (2013), *Digital Solidarity*, PML and Mute Books, Leuphana University, <http://www.metamute.org/sites/www.metamute.org/files/u1/Digital-Solidarity-Felix-Stalder-9781906496920-web-fullbook.pdf>

Struik, D. (1948), Marx and Mathematics, *Science and Society*, 12, 1, pp. 181-196

Terranova, T. (2000), Free labor: producing culture for the digital economy, Social Text, 63, Vol. 18, No. 2, Summer 2000, pp. 33/57.

*The Economist* (2014), Coming to an office near you, Jan 18th

West, J. and Gallagher, S. (2006), Challenges of open innovation: the paradox of firm investment in open-source software, *R&D Management*, 36, 3

Wichita State University, Department of Mathematics and Statistics http://www.math.wichita.edu/history/topics/num-sys.html#mmmmm

1. For a more complete analysis see Carchedi, 2012, chapters 1 e 4. See also Carchedi, 2005. [↑](#footnote-ref-1)
2. This is the temporalist approach whose application solves the so-called transformation problem. See Carchedi, 1984, 2001, and 2012. [↑](#footnote-ref-2)
3. A complete critique of workerism is beyond the scope of this work. See Carchedi, 2012; Henninger, 2007, Starosta, 2012. For some authors, especially of a workerist persuasion, the notion of ‘immaterial’ seems to resemble that of ‘mental’ in this work. Even so the gulf is unbridgeable because workerism rejects Marx’s labour theory of value while the present work retains it and builds a Marxist epistemology upon it. [↑](#footnote-ref-3)
4. Rey (2012, p.406) is one of many holding this view. [↑](#footnote-ref-4)
5. There is no circularity but a succession of MLPs. This is different from the view that “Information is circular, in the sense that it is both input and output … therefore it becomes very difficult to distinguish production, distribution and consumption of information” (Kostakis, 2012, p.2). This comes very close to arguing that information is both the input and the output of the *same* MLP, a mistake made by a great number of authors, Marxist and non-Marxist alike, especially when dealing with the transformation of values into prices. [↑](#footnote-ref-5)
6. See e.g. Denton, P.H. and Restivo, S. (2008), pp. 160-171. [↑](#footnote-ref-6)
7. The notion of ownership of the means of mental production will be dealt with further down. [↑](#footnote-ref-7)
8. As Pfeiffer correctly remarks, “in the present state of research, no clear and conclusive statement can be made that the source of value creation has actually changed” (2013, p. 19). [↑](#footnote-ref-8)
9. For a thorough analysis of the production of video games see Dyer-Witheford and de Peute, 2009. This is a valuable work, in spite of its reliance on the workerist perspective, in that it highlights the interaction of virtual games and the social context within which they are developed. [↑](#footnote-ref-9)
10. For a critique of the cognitive commodity along some of the lines submitted in this work, see Starosta, 2012. [↑](#footnote-ref-10)
11. Also, some agents can perform alternatively productive labour and the function of capital. See Carchedi, 1977. [↑](#footnote-ref-11)
12. See Carchedi, 2012, pp. 220-225. [↑](#footnote-ref-12)
13. Ross (2013) is one of many holding this view. [↑](#footnote-ref-13)
14. For Kostakis (2012, p.6) “users produce value for firms.” For Reveley (2013) users are not producers of value. Users generate data passively and unconsciously (p. 515), and are not ‘primary producers’ (p.516). [↑](#footnote-ref-14)
15. This is also what some blogs do. See Geert Lovink, *Ossessioni collettive*, Università Bocconi Editore, 2011, p. 22. [↑](#footnote-ref-15)
16. According to a survey carried out by Lakhani and Wolf (2005, pp.9-10), 40% of the developers interviewed is paid to participate in open source (OS) projects or can participate in those projects in their working time. [↑](#footnote-ref-16)
17. See also Henninger, 2007 [↑](#footnote-ref-17)
18. See Rey, 2012, but also a host of other authors. [↑](#footnote-ref-18)
19. Or at the cost of its ‘creative professionals’, i.e. skilled mental labourers, inasmuch as the ‘prosumers’ replace them. See Banks and Deuze, 2009. [↑](#footnote-ref-19)
20. This is in line with Marx’s notion of commodities as replaceable due to their common social substance, abstract labour. Marx 1967, pp. 28–9; [↑](#footnote-ref-20)
21. A fuller treatment of these issues presupposes a distinction between and a theory of concrete and abstract individuals and thus between individual and social phenomena. See Carchedi, 2012, chapter 1. [↑](#footnote-ref-21)
22. Differently from Gramsci, here the organic intellectual aggregates the view and represents the interests of any social group. [↑](#footnote-ref-22)
23. This has nothing to do with the workerist notion of general intellect which generates knowledge through a mysterious, because never analysed, collective process of mental production. [↑](#footnote-ref-23)
24. Thus nothing could be further from the truth than that the collective subjectivity cancels individual identity. [↑](#footnote-ref-24)
25. E.O.Wright is one example of such a mistaken approach. See Carchedi, 1989. [↑](#footnote-ref-25)
26. For the symbols KN, KL, and KO , refer back to relation (2) above. For the sake of simplicity, K0 is disregarded. [↑](#footnote-ref-26)
27. The same procedure allows us to answer the regression ad infinitum in the so-called transformation problem. See Carchedi, 2012. [↑](#footnote-ref-27)
28. But as we shall see shortly the two rationalities usually co-exist in the same form of knowledge. The point is which of the two rationalities is dominant. [↑](#footnote-ref-28)
29. The following two paragraphs are taken from Carchedi, 2012, pp. 258-9, where more details can be found. [↑](#footnote-ref-29)
30. Se Dirk J. Struik, 1948; see also Wichita State University. [↑](#footnote-ref-30)
31. The capitalists can pursue their own goals also indirectly, by defending the specific collective interests of those social groups in whose collective knowledge capital’s rationality is dominant. [↑](#footnote-ref-31)
32. “The accumulation of knowledge and skill, of the general productive forces of the social brain [are] absorbed into capital” Marx, 1973, p. 694. [↑](#footnote-ref-32)
33. This raises the issue of the role of non-violence in labour’s strategy. This issue is beyond the scope of this article. [↑](#footnote-ref-33)
34. Dyer-Witheford and de Peute (2009) provide an excellent analysis of the ideological nature of virtual games. However, this study is embedded in a workerist frame, an approach radically different from that followed in this work. [↑](#footnote-ref-34)