

The System of Machinery and Determinations of Revolutionary Subjectivity in the *Grundrisse* and *Capital*¹

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This chapter proposes a reading of Marx's exposition of the forms of the real subsumption of labour to capital – in particular, the system of machinery of large-scale industry – as constituting the dialectical presentation of the determinations of revolutionary subjectivity. The proposition that the real subsumption constitutes the ground of revolutionary subjectivity should come as no surprise. In reality, this is no more than the concretisation of that insight about the most general determination of the process of 'natural history' constituting the development of humanity that Marx expounded in the Paris manuscripts of 1844. According to that early text, the content of the history of the human species consists in the development of the specific material powers of the human being as a working subject, that is, of *human productive subjectivity*. It is in the historical transformation of its material and social forms, Marx concluded, that the key to the abolition of capital – hence, to revolutionary subjectivity – should reside. However, that early attempt at the critique of political economy could not offer a rigorous scientific comprehension of the social determinations underlying the revolutionary transformation of society. Armed with a Feuerbach-inspired method of transformative criticism, Marx managed *analytically* to uncover alienated labour as the hidden *social* foundation behind

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the reified objectivity of 'economic categories'. In turn, in those early writings he analytically discovered the specificity of the human species-being (i.e., human productive subjectivity) as the *material* content historically developing in that alienated form. However, although these discoveries allowed Marx to grasp the *simplest* (human) determination behind the content and form of the abolition of alienated labour, he arguably failed at *synthetically* unfolding the further mediations entailed by the social and material constitution of the revolutionary subject.²

The theoretico-practical need for the further dialectical development of the critique of political economy, which would eventually lead Marx to write *Capital*, expresses the following fact. The immanent ground of revolutionary subjectivity is not simple and unmediated; for instance, the sheer general materiality of human productive practice as the negated content behind the alienated objectivity of capitalist social forms.³ Instead, it is a 'unity of many determinations', which therefore means that its scientific comprehension can only be the result of a complex dialectical investigation involving both the analytic movement from the concrete to the abstract and the synthetic, mediated return to the concrete starting point.⁴ Dialectical research must therefore analytically apprehend all relevant social forms and synthetically reproduce the 'inner connections' leading to the constitution of the political action of wage-labourers as the form taken by the revolutionary transformation of the historical mode of existence of the human life-process.

Now, as the title of Marx's most important work denotes, the subject whose determinations the dialectical investigation proceeds to discover and present is *capital*, which, as the alienated subject of social life, becomes 'the all-dominating economic power of bourgeois society' and must therefore 'form the starting-point as well as the finishing-point' of the ideal reproduction of the concrete.⁵ This does not leave revolutionary subjectivity outside the scope of the dialectical unfolding of capitalist social forms. Rather, it means that revolutionary subjectivity itself must be comprehended as the realisation of an immanent determination of capital as alienated subject.⁶ Accordingly, its dialectical *presentation*

2. Starosta 2005.

3. As argued by so-called 'Open Marxists'. See Bonefeld, Gunn and Psychopedis (eds.) 1992.

4. Iñigo Carrera 2003.

5. Marx 1993, p. 107.

6. This point was insightfully hinted at in the 1970s by Giacomo Marramao in his critical appraisal of the polemic between the more subjectivist positions of Korsch and the Dutch Left Communists (Pannekoek, Gorter) and the objectivism of defenders of the theory of capitalist breakdown (Mattick, Grossmann). See Marramao 1975/6, pp. 152–5, and 1982, pp. 139–43. At least formally, Marramao correctly highlighted the necessity to ground the genesis of class-consciousness 'in terms of the process of production and

must essentially consist in the *synthetic* unfolding of the contradictory movement between materiality and capital-form up to its absolute limit, revealing the proletariat's self-abolishing action as the necessary form in which the former content asserts itself.⁷

It was fundamentally in *Capital* (but, crucially, also in the *Grundrisse*), mainly through the exposition of the determinations of the different forms of production of relative surplus-value (hence of the real subsumption of labour to capital), where Marx managed to concretise the systematic dialectic of alienated human labour. He did this by showing precisely what the capital-form does to the materiality of human productive subjectivity as it takes possession of, and transforms, the labour-process. Seen externally, the implicit concrete question under investigation was the following: does capital transform human productive subjectivity in a way that eventually equips the latter with the material powers to transcend its alienated social form of development? From this materialist standpoint, only if this were the case would it make sense to pose the question of conscious revolutionary action as a concrete objective potentiality immanent in capitalist society.⁸ In other words, Marx's point was the need to discover the material determinations of communist society in their present mode of existence as an *alienated potentiality* engendered by the autonomised movement of the capital-form to be realised – that is, turned into *actuality* – precisely and necessarily through the conscious revolutionary action of the self-abolishing proletariat.

Those determinations appear scattered and are just mentioned in passing in several of Marx's texts. They all characterise the simplest defining character of communism as the fully self-conscious organisation of social labour as a collective potency by the thereby freely associated producers. It is in the *Grundrisse*, in the context of the critique of Adam Smith's conception of labour as sacrifice, that Marx offers the clearest and most concise characterisation of the general attributes of what he calls 'really free working':

The work of material production can achieve this character [as 'really free working', GS] only (1) when its social character is posited, (2) when it is of

reproduction', that is, within the 'objectivity of social relations' and their (autonomised) self-movement. In other words, Marramao clearly saw the necessity to establish a firm connection between the critique of political economy and the 'theory of revolution'. More recently, the point about need to find the immanent ground of emancipatory subjectivity in the contradictory unfolding of the reified forms of social mediation of capitalist society has been forcefully made by Postone 1993, although his own attempt is not without weaknesses. See Starosta 2004.

7. For an elaboration of the methodological underpinnings of this point, see Iñigo Carrera's chapter in this book.

8. Marx 1993, p. 159.

a scientific and at the same time general character, not merely human exertion as a specifically harnessed natural force, but exertion as subject, which appears in the production process not in a merely natural, spontaneous form, but as an activity regulating all the forces of nature.⁹

The interesting and ‘intriguing’ aspect of this passage is that Marx not only claims that in order to be really free, labour must become a consciously organised, directly social activity, but also that the consciousness regulating that emancipated productive activity must be of a *general* and *scientific* kind. As we shall see later, this latter attribute, scarcely mentioned by Marx on other occasions,¹⁰ will prove of paramount importance for our comprehension of the concrete determinations of revolutionary subjectivity; a task that Marx himself achieved, although not without tensions and ambiguities. At this stage, I would just like to reformulate the question of the relation between capital and productive subjectivity posed above in the light of that passage from the *Grundrisse*. Does the development of capital transform human productive subjectivity in such a way as to engender the necessity of producing the latter with the two general attributes mentioned by Marx? Furthermore, is the working class the material subject bearing them?

In this paper, then, I discuss the way in which Marx, through the dialectical exposition of the contradictory movement of the real subsumption, actually presented the genesis of the revolutionary subject. The argument is firstly developed through a close reading of Marx’s discussion of the determinations of large-scale industry in *Capital*, as the latter constitutes the most developed form of real subsumption. The essence of this capitalist transformation of the production-process of human life lies in the mutation of the productive attributes of the collective labourer according to a determinate tendency: the individual organs of the latter eventually become *universal productive subjects*. This is the inner *material* determination underlying the *political* revolutionary subjectivity of the proletariat. However, I argue that Marx’s dialectical exposition of those transformations in *Capital* is in some respects truncated and does not unfold the plenitude of the material determinations underlying the revolutionary existence of the working class. The latter is presented as no more than an abstract possibility. A gap therefore remains between the ‘dialectic of alienated human labour’ unfolded in the chapters on relative surplus-value in *Capital*, and the revolutionary conclusions at the end of Volume I in the chapter on ‘The Historical Tendency of Capital Accumulation’. The paper finally suggests that the so-called ‘Fragment on machines’ from the *Grundrisse* contains a different but complementary perspec-

9. Marx 1993, pp. 611–12.

10. See, however, Marx’s remarks in the *Paris Manuscripts* on the need for the constitution of ‘natural science of man’ or ‘human natural science’ as the basis for emancipated human practice. Marx 1992b, p. 355.

tive on the productive subjectivity characteristic of large-scale industry. Through a careful reading of the relevant passages of that earlier version of the critique of political economy, it is possible to undertake the completion of the systematic unfolding of the social and material determinations of revolutionary subjectivity.

Large-scale industry and workers' productive subjectivity in *Capital*

The guiding thread running through Marx's exposition of the concrete forms of the production of relative surplus-value resides in the revolutions to which capital subjects the productive subjectivity of the doubly free labourer as the means for the multiplication of its power of self-valorisation. However, it is not there that Marx's presentation of the determinations of large-scale industry begins. The reason for this derives from the very starting point of the production of relative surplus-value through the system of machinery that characterises large-scale industry. As Marx points out, if in manufacture the point of departure of the transformation of the material conditions of social labour was productive subjectivity as such (with the transformation of the instrument of labour, in the form of a specialisation, determined as a result of the former), in large-scale industry the transformation of the instrument of labour constitutes the starting point, the transformation of the wage-labourer being its result.¹¹

Marx presents the essence of this transformation of the human labour-process by developing the specific materiality of machinery, in particular *vis-à-vis* the labour-process in manufacture. In reality, the simplest determination of that difference was already anticipated by Marx in the transition contained in the previous chapter of *Capital*, where the necessity of the development of machinery was laid bare. I am referring to capital's need to do away with the subjective basis of manufacture through the development of an 'objective framework' for material production, independent of the manual expertise and immediate practical knowledge of workers. In brief, it is about giving an objective form to the powers of social labour springing from direct productive co-operation.¹²

The two-fold material specificity of the machine thereby springs from the objectification of both the – however restricted – knowledge and manual skills and strength of the manufacturing labourer. On the one hand, capital strives to substitute the movement of the forces of nature for that of the human hand as the immediate agent in the transformation of the object of labour into a new use-value. On the other hand, it attempts to displace the immediate subjective experience of the worker as the basis for the conscious regulation of the

11. Marx 1976a, p. 492.

12. Marx 1976a, pp. 490–1.

labour-process, that is, as the basis for knowledge of the determinations of the latter. This implies, in the first place, the need to turn the production of that knowledge into an activity which, whilst clearly remaining an inner moment of the organisation of social labour, nonetheless acquires a differentiated existence from the immediacy of the direct production-process. Coupled with the need to objectify it as a productive power directly borne by the 'dead labour' represented in the machine, that knowledge must necessarily take the general form of *science*.¹³ Capital thereby advances, for the first time in human (pre)history, in the generalisation of the application of science as an immediate potency of the direct production-process.¹⁴ Note, however, that at this stage of the exposition scientific knowledge does not appear directly as productive activity but only as already objectified in the form of the machine, that is, simply as a presupposition for the latter's existence.

Thus far, these are the fundamental aspects of Marx's exposition of the *material* specificity of the production-process of capital based on the system of machinery, i.e., the transformations it suffers in its aspect as a process of production of use-values. However, the process of production of capital is such for being the unity of the labour-process and the valorisation-process. Hence, Marx's presentation goes on to develop the specific impact of the system of machinery on the conditions for value's self-expansion, on the *form-determinations* of the production-process of capital.¹⁵ With this, Marx's presentation exhausts the novel determinations brought about by the system of machinery to the production-process as they pertain to its 'objective factor'. What necessarily follows, then, is the investigation of the impact of these transformations on the 'subjective factor' of the labour-process, that is, on the worker.

In the third section of the chapter on large-scale industry, Marx initially presents what he refers to as only 'some general effects' of the system of machinery on the worker, that is, those changes that can be discussed without developing the specific form in which the 'human material is incorporated with this objective organism'.¹⁶ In other words, these are the effects whose development does not involve any new *qualitative* determination in the productive subjectivity of workers. Rather, they refer to the *quantitative* changes that machinery brings about in capital's valorisation-process as a process of exploitation of living labour. These include: the quantitative extension of the mass of exploitable labour-power through the incorporation of female and child-labour; the tendency

13. Marx 1976a, p. 508.

14. Marx 1994, p. 32.

15. Marx 1976a, pp. 508–17.

16. Marx 1976a, p. 517.

to prolong the working day; and the tendency to increase the intensive magnitude of the exploitation of human labour.

It is in section four, through the presentation of the functioning of 'the factory as a whole', that Marx starts to unfold the specific *qualitative* determinations of the productive subjectivity of large-scale industry. The discussion of a passage from Ure serves Marx succinctly to identify the most general determination of the factory as the sphere of capitalist society where the conscious regulation of an immediately social production-process takes place. A conscious regulation, however, that is determined as a concrete form of the *inverted general social regulation* as an attribute of the materialised social relation in its process of self-expansion. In the factory – and this is the issue that Ure's definition overlooks – this inverted social existence reaches a further stage in its development by acquiring a 'technical and palpable reality'.¹⁷

Thus, the scientific conscious regulation of social labour characterising large-scale industry is not an attribute borne by those workers performing direct labour in the immediate production-process. For them, those powers exist already objectified in the system of machinery, to whose automatic movement they have to subordinate the exercise of their productive consciousness and will, to the point of becoming 'its living appendages'.¹⁸ Large-scale industry consequently entails an enormous scientific development of the 'intellectual faculties of the production process' only by exacerbating their separation from direct labourers. In its mode of existence as a system of machinery, the product of labour comes to dominate the worker in the direct process of production not only formally but even materially as well. Capital thus appears to those workers as the *concrete material subject* of the production-process itself.

With all these elements, we can now turn to summarise the specific determination of the productive subjectivity of the worker of large-scale industry. In (*tendentially*) doing away with the need for all specialised skill and knowledge of workers, the production of relative surplus-value through the system of machinery gives the development of their productive subjectivity the concrete form of an *absolute degradation*. In this brutal way, and in opposition to the *particularism* of the subjectivity of the wage-labourer of manufacture, large-scale industry begets, as its most genuine product, a *universal worker*, that is, a productive subject capable of taking part in any form of the human labour-process. In the words of Marx:

Hence, in place of the hierarchy of specialised workers that characterizes manufacture, there appears, in the automatic factory, a *tendency* to equalize

17. Marx 1976a, p. 548.

18. *Ibid.*

and reduce to an identical level every kind of work that has to be done by the minders of the machines; in place of the artificially produced distinctions between the specialized workers, it is natural differences of age and sex that predominate.¹⁹

With this tendency to the production of workers who are capable of working with any machine, the simple material or technical necessity for the life-long attachment of individuals to a single productive function disappears.²⁰ However, insofar as machines become specialised into certain particular productive functions, the persistence of the division of labour in the factory is still technically *possible*. Indeed, Marx argues, the exploitative relation between capitalists and workers that mediates the development of the material productive forces of social labour as an alienated attribute of its product, leads to the reproduction of the 'old division of labour' in an even more hideous fashion.²¹ Large-scale industry's tendency to produce an increasingly universal worker is thereby realised in the concrete form of its negation, that is, by multiplying the spaces for the exploitation of living labour on the basis of an exacerbation of 'ossified particularities'. Thus, the individual capitalist could not care less about the disappearance of the technical necessity for a particularistic development of the worker's productive subjectivity. Under the pressure of competition, his/her only individual motive is the production of an extra surplus-value. If he/she can obtain it by attaching the worker to 'the lifelong speciality of serving the same machine',²² so he/she will. In effect, the reproduction of the division of labour under the new technical conditions implies that a lower value of labour-power can be paid – since 'the expenses necessary for his [the workers', GS] reproduction' are 'considerably lessened'. In addition, it implies that a greater docility on the part of the exploitable human material is induced – since 'his helpless dependence upon the factory as a whole, and therefore upon the capitalist, is rendered complete'.²³

It is crucial, at this juncture, to be clear about this contradictory movement between universality and particularity of the determinations of the productive subjectivity of large-scale industry. Paraphrasing Marx, here, as everywhere else, we must distinguish between the general tendency of capital-accumulation and the concrete forms in which the essence of the historical movement is realised. *Thus, the essential determination which, as we shall see, expresses the reason to be of the capitalist mode of production, lies in the tendency to universalise the productive attributes of wage-labourers.* This is the general movement of the production of

19. Marx 1976a, p. 545, my emphasis.

20. Marx 1976a, p. 546.

21. Marx 1976a, p. 547.

22. *Ibid.*

23. *Ibid.*

relative surplus-value through the system of machinery which underlies – hence, gives unity to – the variegated forms that the labour-process presents in the course of capitalist development. In order to substantiate this, let us now move ahead in our reading of Marx’s investigation of large-scale industry to the point in *Capital* where he further unfolds the movement of the identified contradiction, that is, to the subsequent discussion of factory-legislation in section nine of this same chapter.²⁴

The crucial point for our argument is that section nine completes (as far as *Capital* is concerned) the development of the specific determinations of the productive subjectivity of large-scale industry. In effect, Marx’s exposition in section four had left the dialectical presentation with an unresolved contradiction between large-scale industry’s general tendency for universality and the exacerbation of the particularism of the division of labour that, left to the unrestrained will of individual capitalists, it allowed. In addition, we shall see how this discussion leads Marx, for the first time in his dialectical exposition, to uncover the revolutionary historical potentialities carried by this specifically capitalist form of human labour-power.

24. In my view, Marx’s presentation is not fully clear and consistent in distinguishing between essential determination (and therefore general tendency) and concrete form in which it is realised. This lack of clarity probably stems from the uneasy co-existence of systematic and historical moments in the exposition. Thus, he firstly presents the general determination of the productive subjectivity of large-scale industry (namely, its universality) ‘in its purity’, without necessarily implying that it has been fully realised in its historical concrete forms. However, in his subsequent empirical illustrations he seems to treat the general determination as an immediate actuality. He therefore posits the persistence of the particularistic development of productive subjectivity as ‘artificially’ reproduced by superimposing the division of labour where its technical necessity has actually disappeared. See Marx 1976a, pp. 546–7, where he remarks that the insignificance of ‘on-the-job’ skills required for machine-work has done away with the need to bring up a special kind of worker and that the attachment of the worker to a single specialised machine represents a ‘misuse’ of the latter. While this might have been more or less the case in the particular industries that he discusses, this was by no means the general situation of large-scale industry in his time. The general tendency for a universal productive subjectivity is realised only *gradually* in the historical course of capital-development. In this sense, the technical necessity for particularistic attributes of labour-power is not done away with overnight. Without a doubt, the historical development of large-scale industry registers a tendency for the degradation of experienced-based (‘tacit’) knowledge of the determinations of the labour-process. However, the progress of capitalist automation has so far involved the recreation of the technical necessity for certain (albeit increasingly more limited) particularistic development of productive subjectivity. Thus, even during the so-called ‘Fordist’ cycle of accumulation, the full mastery of machines required a relatively lengthy learning process achieved by flanking a skilled operator. Only with the more recent wave of computer-based automation have particularistic or experienced-based skills significantly lost their former centrality (without, however, fully disappearing). On these recent transformations in the labour-process, see Balconi 2002.

The movement of 'the contradiction between the division of labour under manufacture and the essential character of large-scale industry'²⁵ acquires a first expression in the establishment of compulsory elementary education for working children. As Marx points out, the unchecked exploitation of child-labour by individual capitals led not only to the 'physical deterioration of children and young persons',²⁶ but also to an artificially-produced intellectual degeneration, which transformed 'immature human beings into mere machines for the production of relative surplus-value'.²⁷ Since 'there is a very clear distinction between this and the state of natural ignorance in which the mind lies fallow without losing its capacity for development, its natural fertility',²⁸ these excesses of the capitalist exploitation of child labour-power eventually reacted back on the very capacity of valorisation of total social capital by jeopardising the existence of the future generation of adult-workers in the 'material and moral conditions' needed by capital-accumulation itself. This is illustrated by Marx through a discussion of the case of the English letter-press printing trade, which, before the introduction of the printing machine, was organised around a system of apprenticeship in which workers 'went through a course of teaching till they were finished printers' and according to which 'to be able to read and write was for every one of them a requirement of their trade'.²⁹ With the introduction of printing machines, however, capitalists were allowed to hire children from 11 to 17 years of age, who 'in a great proportion cannot read' and 'are, as a rule, utter savages and very extraordinary creatures'.³⁰ These young workers were day after day attached to the simplest of tasks for very long hours until being 'discharged from the printing establishments' for having become 'too old for such children's work'.³¹ Those 17-year-old workers were left in such intellectual and physical degradation that they were unfit to provide capital, *even in the same factory*, with the miserably restricted productive attributes that it required from its immediate source of surplus-value, namely, human labour-power.

The education-clauses of the factory-legislation allow Marx not only to dispel any doubt about capital's 'universal vocation' in its transformation of human productive subjectivity. They also serve to highlight, for the first time in his whole dialectical exposition, that it is *only* the development of *that* specific form of human productive subjectivity that expresses capital's historic movement in the

25. Marx 1976a, p. 615.

26. Marx 1976a, p. 520.

27. Marx 1976a, p. 523.

28. *Ibid.*

29. Marx 1976a, p. 615.

30. *Ibid.*

31. *Ibid.*

production of the material powers for its own supersession as the general social relation regulating human life:

As Robert Owen has shown us in detail, the germ of the education of the future is present in the factory system; this education will, in the case of every child over a given age, combine productive labour with instruction and gymnastics, not only as one of the methods of adding to the efficiency of production, but as the only method of producing fully developed human beings.³²

Notice, however, that Marx makes clear that the education-clauses represent the *germ* – and just that – of the ‘education of the future’. To put it differently, Marx’s discussion aims at showing *both* that the social forms of the future are effectively carried as a potentiality by the productive subjectivity of large-scale industry under consideration *and* that, with the determinations unfolded so far, this potentiality is not yet immediate. On the contrary, in their ‘paltriness’, the education-clauses reveal that these determinations are far from being a ‘method of producing fully developed human beings’. Rather, they are forms of positing individuals whose productive subjectivity is still trapped within the miserable forms imposed by the reproduction of the conditions for capital’s valorisation. Other material transformations are still needed to mediate the development of those germinal elements into their plenitude.

The total social capital’s necessity to produce universal workers is not exhausted by the obstacles to its valorisation posed by the division of labour within the workshop. As Marx remarks, ‘what is true of the division of labour within the workshop under the system of manufacture is also true of the division of labour within society’.³³ In effect, inasmuch as the technical basis of large-scale industry is essentially revolutionary, it entails the permanent transformation of the material conditions of social labour and, therefore, of the forms of exertion of the productive subjectivity of individual workers and of their articulation as a directly collective productive body.³⁴ This continuous technical change thereby requires individuals who can work in the ever-renewed material forms of the production of relative surplus-value. ‘Thus’, Marx concludes, ‘large-scale industry, by its very nature, necessitates variation of labour, fluidity of functions, and mobility of the worker in all directions’.³⁵ However, he also points out again how the general organisation of social production through the valorisation of independent fragments of social capital negates the immediate realisation of this tendency for an all-sided development of individuals.³⁶ The private fragmentation of social

32. Marx 1976a, p. 614.

33. Marx 1976a, p. 615.

34. Marx 1976a, p. 617.

35. *Ibid.*

36. See Bellofiore 1998a, for suggestive reflections on this question.

labour, and its reified social mediation through the capital-form, permits the reproduction of ‘the old division of labour with its ossified particularities’.³⁷ Thus it gives the imposition of variation of labour the form of ‘an overpowering natural law, and with the blindly destructive action of a natural law that meets with obstacles everywhere’.³⁸ In this contradictory form, the realisation of large-scale industry’s tendency to produce universal workers nonetheless marches forward, also revealing that it is in the full development of this determination that this alienated social form finds its own *absolute limit*.³⁹ In other words, that it is on the fully-expanded universal character of human productive subjectivity that the *material basis* for the new society rests.

This possibility of varying labour must become a general law of social production, and the existing relations must be adapted to permit its realization in practice . . . the partially developed individual, who is merely the bearer of one specialised social function, must be replaced by the totally developed individual, for whom the different social functions are different modes of activity he takes up in turn.⁴⁰

With this discussion Marx unfolds the way in which the general necessities of the reproduction of the total social capital – in this case, workers bearing a universal productive subjectivity – clashes with its concrete realisation through the private actions of individual capitals (which strive for the perpetuation and exacerbation of the particularistic development of productive subjectivity). Moreover, we see how this contradiction moves by determining the working class as the personification of the mediated necessities of the valorisation of capital, the latter providing the material and social foundation for proletarian political power.⁴¹ In

37. Marx 1976a, p. 617.

38. Marx 1976a, p. 618.

39. Marx 1976a, p. 617.

40. Marx 1976a, p. 618.

41. By ‘mediated necessities’, I denote those that are a moment of the production of surplus-value, but that are antithetical to the simplest (hence immediate) necessity of self-valorising value to increase its magnitude by any means personified by individual capitals. Although a proper discussion of this essential point exceeds the scope of this chapter, I think that this discussion illustrates the way in which Marx sees the systematic connection between capital-accumulation and class-struggle. Specifically, Marx presents the class-struggle as the most general *direct* social relation through which the *indirect* relations of capitalist production assert themselves. On this point, see Iñigo Carrera 2003, pp. 5–6. Whilst this certainly means that class-antagonism is an endemic reality of capitalist production, it also means that it is not the self-moving content behind its development (as argued, for example, by Bonefeld 1995). Moreover, neither does its simple existence as such immediately express the emergence of an antagonistic principle of organisation of social life other than the valorisation of capital, which would be, in turn, incarnated in the working class (as in the so-called ‘Autonomist Marxist’ approach; see Cleaver 1992 and De Angelis 1995). Instead, the systematic place of the class-struggle as a social form shows that the production of surplus-value is a potentiality of

effect, the development of large-scale industry makes the possession of a universal subjectivity a matter of survival for the members of the working class since, as evidenced by the aforementioned case of the printing-trade workers, only in that way can they be in a position to sell their labour-power to capital (thereby turning the alienated necessities of social capital into an immediate need for their social and material reproduction). Thus, workers have to 'put their heads together' again and, through their struggle as a class, force the capitalist state to 'proclaim that elementary education is a compulsory pre-condition for the employment of children'.⁴² But what is elementary education if not a – certainly very basic – step in the formation of future *universal workers*? That is, in the development of productive attributes that equips the labourer to work not in this or that particular aspect of the immediately social labour-process of the collective labourer of large-scale industry, but in whatever task that capital requires from him or her?⁴³

Social capital's need for universal workers thereby provides another material basis for the political power of the working class in its confrontation with the capitalist class over the conditions of its social reproduction. In this first expression of that relation between large-scale industry and workers' power represented by the Factory-Acts, the class-struggle does not appear to transcend its most general determination as the form of the buying/selling of the commodity labour-power at its value, which Marx unfolds in Chapter ten on 'The working day'.⁴⁴ Yet Marx advances the proposition that, when concretely developed, that tendency towards universal productive subjectivity will eventually provide the

the alienated movement of social labour *in its unity*. In other words, Marx's exposition of the social form of class-struggle makes evident that the concrete subject of the process of valorisation – and hence of the movement of alienated social reproduction – is the *total social capital*. Compare Starosta 2005, Chapter Five. This does not imply the denial of the transformative powers of human practice personified by the workers. What this does imply is that whatever transformative powers the political action of workers might have – *both* capital-reproducing *and* capital-transcending political action – must be an immanent determination begotten by the alienated movement of capital as subject and not external to it.

42. Marx 1976a, p. 613.

43. Recent historical developments of machine-based production have confirmed the general tendency identified by Marx: degradation of particularistic productive attributes developed on the job, coupled with expansion of the requirements of formal education to produce its more *universal* dimensions. The latter is the necessary prerequisite for the constitution of the more general and abstract knowledge that the contemporary operator of computer-based technologies sets into motion vis-à-vis the 'Fordist' machinist ('controlling' the carrying out of a task rather than actually 'doing' it). See Balconi 2002.

44. See Kicillof and Starosta 2007a and 2007b; Iñigo Carrera 2003, pp. 81–2, and Müller and Neusüss 1975.

class-struggle with expanded transformative powers, namely, those necessary for the establishment of the workers' 'political supremacy' as a class.⁴⁵

Now, the question immediately arises as to what are the more concrete determinations behind this inevitability of the proletarian conquest of political power? Unfortunately, Marx provides no answer in these pages. In fact, one could argue that no answer could have been provided at all. The unfolding of the necessity of 'proletarian dictatorship' as a concrete social form involves still more mediations and, therefore, the former is not carried by the social form we are facing at this point of the exposition in the form of an *immediate potentiality* to be realised through the political action of the workers as a class.⁴⁶ Thus, at this stage of the dialectical presentation, both this latter remark and the one discussed above regarding the totally-developed individual as the basis for the abolition of capital, cannot be but unmediated observations, external to the concrete determinations of the productive subjectivity of large-scale industry that we have before us. On the other hand, inasmuch as the latter *does* involve *a certain degree* of universality, a limited, albeit real, expression of the underlying tendency for the production of its fully-developed shape, Marx's reflections, although external, are undoubtedly pertinent. From a methodological point of view, he could therefore legitimately introduce those remarks in order to anticipate the direction that the further unfolding of this historically-specific contradiction of the capitalist mode of production – 'the only historical way in which it can be dissolved and then reconstructed on a new basis' – should take.⁴⁷ But as a proper, complete dialectical account of the determinations underlying the proletarian conquest of political power or, above all, of the revolutionary production of the free association of individuals, the presentation as so far developed definitely falls short.

This, in itself, should not be problematic. From the perspective of the dialectical investigation as such, this juncture of our critical reading of Marx's search for the determinations of revolutionary subjectivity is not a dead-end at all. It only means that our journey from the abstract to the concrete needs to proceed forward as our end-point – namely, revolutionary subjectivity – still lies ahead. In this sense, no anomaly lies before us. However, the question is very different when approached from the standpoint of the elements for such an investigation we can find already objectified in Marx's *Capital*. In that respect, the problem that the contemporary reader of *Capital* attempting to discover those determinations faces is, to put it briefly, that *they are not there*. Let us expand on this point.

45. Marx 1976a, p. 619.

46. This would need the exposition of the tendency for the concentration and centralisation of capital as the alienated expressions of the socialisation of labour in the capitalist mode of production and whose absolute limit is reached when the total capital of society immediately exists as a single capital. Compare Marx 1975, p. 780.

47. Marx 1976a, p. 619.

We have seen how Marx, when faced with the tendential universality of the worker of large-scale industry and the growing conscious regulation of social labour it entails, *extrinsically* reflects upon the specific material form of productive subjectivity necessary to 'build society anew' on a really free basis. On the other hand, we have highlighted the methodological pertinence of such a reflection given that – as the passage on 'really free working' from the *Grundrisse* quoted above stated – the latter itself has as one of its determinations that of being a bearer of universal productive attributes, that is, capable of 'material production of a general character'. So far so good. But, as the reader will remember, the attribute of universality did not exhaust the determinations of the form of *productive* subjectivity with the immediate potentiality for 'really free working' (which, as I argued, should provide the material foundation of revolutionary *political* subjectivity). In the first place, the latter also entailed a process of material production whose general social character was immediately posited. This condition is present – at least tendentially – in the productive subjectivity of large-scale industry as developed in *Capital* too.⁴⁸ But, in addition, note that Marx's passage from the *Grundrisse* mentions that the universality of 'revolutionary' productive subjectivity must be the expression of a *scientific* consciousness, capable of organising work as 'an activity regulating all the forces of nature'. And here lies the crux of the matter.

Although the productive subjectivity of the worker of large-scale industry as presented in *Capital* tends to become universal, this universality is not the product of the *scientific expansion* of his or her capacity consciously to regulate the production-process, but of the increasing (eventually absolute) *deprivation* of all knowledge of the social and material determinations of the labour-process of which he or she is part. As we have seen above, for the workers engaged in the direct process of production, the separation of intellectual and manual labour reaches its plenitude. This kind of labourer can certainly work in any automated labour-process which capital puts before him or her, but not as the 'dominant subject' with 'the mechanical automaton as the object'. Rather, for those workers 'the automaton itself is the subject, and the workers are merely conscious organs, co-ordinated with the unconscious organs of the automaton, and together with

48. In the chapter on 'Machinery and large-scale industry', the tendency to expand the scope of the conscious regulation of the social character of labour co-exists with an opposite tendency to multiply the number of privately-mediated branches of the social division of labour, which is also the product of the movement of this form of production of relative surplus-value. See Marx 1976a, p. 572. But no reason is given for one or the other tendency to prevail. This occurs later in Marx's presentation, when he unfolds the determinations of the 'General law of capitalist accumulation'. There, the tendencies to the concentration and centralisation of capital show how the first tendency eventually imposes itself over the second.

the latter, subordinated to the central moving force'.⁴⁹ The scientific productive powers needed to regulate the forces of nature, and which are presupposed by their objectified existence in a system of machinery, are not an attribute that capital puts into the hands (or, rather, the heads) of direct labourers. In brief, in the figure of this wage-labourer bearing what, following Iñigo Carrera,⁵⁰ I term an absolutely *degraded productive subjectivity*, scientific consciousness and universality do not go together but are in opposition to one another. In other words, it is not this degraded productive subjectivity that, simply as such, carries in its immediacy the historical revolutionary powers that Marx himself considered necessary to make capital 'blow sky high'. Moreover, neither has Marx's exposition demonstrated that the very movement of the present-day alienated general social relation – capital-accumulation – leads to the social necessity to transform, in the political form of a revolution, the productive subjectivity of those labourers in the direction of their re-appropriation of the powers of scientific knowledge developed in this alienated form.

Yet, despite this insufficiency as an account of the material genesis of the revolutionary subject, it is here that Marx's exposition in *Capital* of the determinations of human productive subjectivity as an alienated attribute of the product of labour comes to a halt.⁵¹ In the rest of Volume I (and the two remaining volumes), Marx no longer advances, in any systematic manner, in the unfolding of the material and social determinations of the revolutionary subject. From the point of the presentation reached, and after moving to the exteriority of the inner determinations of the production of surplus-value and to its reproduction, accumulation and the general law that presides over its movement, he just makes a gigantic leap into the conclusion contained in the chapter on the 'Historical tendency of capitalist accumulation', offering the following well-known account of the determinations leading to the abolition of the capitalist mode of production:

Along with the constant decrease in the number of capitalist magnates, who usurp and monopolize all the advantages of this process of transformation, the mass of misery, oppression, slavery, degradation and exploitation grows; but with this there also grows the revolt of the working class, a class constantly increasing in numbers, and trained, united and organized by the very

49. Marx 1976a, pp. 544–5.

50. Iñigo Carrera 2003.

51. This statement needs qualification insofar as the creation of a surplus population relative to the needs of the accumulation process also constitutes a transformation of productive subjectivity produced by the development of large-scale industry. More concretely, it represents the most extreme case of material mutilation of the productive attributes of the working class, that is, not simply their degradation but their outright non-reproduction.

mechanism of the capitalist process of production. The monopoly of capital becomes a fetter upon the mode of production which has flourished alongside and under it. The centralization of the means of production and the socialization of labour reach a point at which they become incompatible with their capitalist integument. The integument is burst asunder. The knell of capitalist private property sounds. The expropriators are expropriated.⁵²

If we leave aside the question of the misleading conflation between two *qualitatively different* (and, therefore, *analytically separable*) ‘moments’ of the revolutionary action of the working class contained in this passage – namely, the expropriation of the bourgeoisie and the abolition of capital – the question remains as to whether the determinations developed by Marx in the previous chapters suffice to justify the transition to this excessively simplistic and all too general account of the way ‘the capitalist integument is burst asunder’.⁵³ Certainly, the tendency to the centralisation of capital discussed in the chapter on the ‘General law of capital accumulation’ does provide an exposition of the necessity behind the progressive socialisation of labour as an attribute of the capitalist form of private labour. But such an account stops short at the exteriority of the *quantitative determination* of the scope of consciously organised social labour without saying anything about the *qualitative transformations* of the productive subjectivity of the collective labourer that such an extension of the scale of the former presupposes. Seen from that perspective, I think that the transition to revolutionary subjectivity contained in the passage is definitely unmediated.

52. Marx 1976a, p. 929.

53. Whatever the ambiguities of Marx’s formulation in the passage from the chapter on the historical tendency of capital-accumulation cited above, a cursory reading of his so-called ‘political writings’ makes evident that he was very clear about the ‘unity-in-difference’ between the expropriation of the bourgeoisie and the abolition of capital. To begin with, this is synthesised in the political programme of the working class to be implemented through the revolutionary ‘conquest of political supremacy’ contained in the *Communist Manifesto*, whose *immediate* economic content unequivocally comes down to the absolute centralisation of capital in the form of state-property (hence the abolition of the bourgeoisie) and the universalisation of the conditions of reproduction of the working class, but does not involve the abolition of the capitalist mode of production. See Marx and Engels 1976, pp. 92–3. As Chattopadhyay 1992, pp. 92–3, competently shows, for Marx the revolutionary conquest of political power together with the expropriation of the bourgeoisie were the *necessary forms* in which to *start* the process of transformation of the capitalist mode of production into the free association of individuals. But, unlike the conception found in Lenin and orthodox Marxism generally, Marx was very clear that the political rule of the working class ‘does not by itself signify the collective *appropriation by society*, and does not indicate the end of *capital*’ (Marx 1992c, p. 93). The ‘dictatorship of the proletariat’ was for Marx a *period within the capitalist mode of production* – hence, not a *non-capitalist transitional society* – in which capital was to be entirely revolutionised in every nook and cranny up to the point of fully preparing wage-workers for their self-emancipation – hence for their self-abolition as working class (Ibid.).

How are those workers whose productive subjectivity has been emptied of almost all content to organise the allocation of the total labour-power of society in the form of a *self-conscious* collective potency (the latter being what the abolition of capital is all about)? The growing 'misery, degradation, oppression and so on' certainly confront those labourers with particularly extreme *immediate* manifestations of the alienated mode of existence of their social being. Therefore, they could lead them to reinforce their collective resistance to capitalist exploitation by strengthening their relations of solidarity in the struggle over the value of labour-power. In themselves, however, those expressions of capitalist alienation have no way of transforming the class-struggle from a form of the reproduction of that alienation into the form of its fully self-conscious transcendence. From a materialist perspective, the question does not boil down to the will radically to transform the world, but to the objective existence of the material powers to do so. As Marx puts it in the *Holy Family*, it is about an 'absolutely imperative need' determined as 'the practical expression of necessity'.⁵⁴ The emergence of the social necessity underlying the historical constitution of the latter still involves the mediation of more revolutions in the materiality of the productive subjectivity of workers.

In this sense, I concur in general with those who claim that Marx's *Capital* is *incomplete*. However, this is not in the sense that the dialectic of capital needs to be complemented with that of class-struggle,⁵⁵ or with the political economy of wage-labour,⁵⁶ as if those latter aspects were not an inner moment of the former itself. Rather, I think that it is the very 'dialectic of capital' and, more concretely, the contradictory movement of the production of relative surplus-value through the system of machinery, that is in need of completion. Without this further exploration into the development of human productive subjectivity as an alienated attribute of social capital, a gap is bound to remain between the 'dialectic of human labour' unfolded in the relevant chapters of *Capital* and the revolutionary conclusions at the end of Volume I.

In the following section, I shall examine Marx's presentation of the determinations of the system of machinery in the *Grundrisse*. Although the complete *systematic* unfolding of the missing determinations is not there either, the main *elements* for such a further investigation of revolutionary subjectivity can be extracted from that text.

54. Marx and Engels 1975a, p. 37.

55. Shortall 1994.

56. Lebowitz 2003.

The *Grundrisse* and the system of machinery: in search of the missing link in the determinations of revolutionary subjectivity

As an entry-point to Marx's account of the system of machinery in the *Grundrisse*, let us return for a moment to our examination of the determinations of large-scale industry as presented in *Capital*. More concretely, let us go back to the relation between science and the production-process. Although this form of production of relative surplus-value entailed the general application of science as a productive force, the latter was not an attribute materially borne by those labourers engaged in direct labour in the immediate process of production. For them, that scientific knowledge took the form of an alien power already objectified in the machine. Marx notes this in the *Grundrisse* as well.⁵⁷

Yet, as Marx puts it in the 'Results of the immediate production process', those scientific powers ultimately are themselves the products of labour.⁵⁸ Thus, although the *formal* subject of those powers – as happens with all the powers springing from the direct organisation of human co-operation – remains capital, the question immediately arises as to who is the *material* subject whose (alienated) *intellectual* labour develops the scientific capacities of the human species and organises their practical application in the immediate process of production. Having discarded manual labourers as such a productive subject, it would seem that the only alternative must be to turn our attention to the only remaining character present in the direct production-process, namely, the capitalist. Is it he or she who personifies, through the development of his/her productive consciousness and will, capital's need for the powers scientifically to control the movement of natural forces? The answer is given by Marx in a footnote to the chapter on 'Machinery and Large-Scale Industry' in *Capital*:

Science, generally speaking, costs the capitalist nothing, a fact that by no means prevents him from exploiting it. 'Alien' science is incorporated by capital just as 'alien' labour is. But 'capitalist' appropriation and 'personal' appropriation, whether of science or of material wealth, are totally different things. Dr. Ure himself deplors the gross ignorance of mechanical science which exists among his beloved machinery-exploiting manufacturers, and Liebig can tell us about the astounding ignorance of chemistry displayed by English chemical manufacturers.⁵⁹

Thus, it is not the capitalist who embodies the intellectual powers to develop the scientific knowledge presupposed by its objectified existence in a system of machinery. The science incorporated in the immediate production-process

57. Marx 1993, p. 693.

58. Marx 1976b, p. 1055.

59. Marx 1976a, p. 508.

is the result of the appropriation of the product of the intellectual labour of an 'other'. This 'other', whose productive activity the direct production-process of large-scale industry carries as a necessary mediation, is not explicitly present in Marx's exposition in *Capital*. There might be two reasons for this exclusion. First, because in Marx's time such a social subject was only beginning to develop. Second, and following from the previous point, because Marx's presentation in *Capital* is restricted to the transformations suffered by the productive subjectivity of those workers remaining in the direct production-process. However, what his whole discussion implicitly suggests is that among the transformations that large-scale industry brings about is the extension of material unity comprising its total labour-process outside the boundaries of the 'factory walls'.⁶⁰ Hence, the direct process of production becomes just an aspect of a broader labour-process which now entails two additional moments: the development of the power consciously to regulate in an objective and universal fashion the movement of natural forces – namely, science – and the application of that capacity in the practical organisation of the automatic system of machinery and whatever remains of direct labour – the technological application of science, including the consciousness of the unity of productive co-operation. Certainly, these other moments are also present in *Capital*.⁶¹ However, Marx's presentation there seems to revolve around the emphasis on their separated mode of existence *vis-à-vis* the subjectivity of direct labourers and which is presupposed by their activity. By contrast, in the *Grundrisse* he oscillates between such an angle on the question⁶² and one which puts at the forefront the underlying material unity of the total activity of living labour, where the development of science and its technological applications act as essential constitutive moments.⁶³ With the system of machinery:

the entire production process appears as not subsumed under the direct skillfulness of the worker, but rather as the technological application of science. [It is,] hence, the tendency of capital to give production a scientific character; direct labour [is] reduced to a mere moment of this process.⁶⁴

60. In this analysis of the further determinations of the production-process of large-scale industry, I follow the approach developed in Iñigo Carrera 2003, pp. 1–37.

61. Marx 1976a, p. 549.

62. Marx 1993, pp. 692–4.

63. Dunayevskaya 1989, pp. 80–6, correctly notes the difference in presentation between the account of the system of machinery in the *Grundrisse* – where the emancipatory potentialities of the system of machinery are considered – and the one in *Capital* – where its determination as a materialised expression of the domination of dead over living labour is emphasised. However, she wrongly attributes that to a change in Marx's view on the subject instead of as an account of *qualitatively different* potentialities engendered by the very same development of the system of machinery and personified by the different partial organs of the collective labourer.

64. Marx 1993, p. 699.

The determinations presupposed by the production of relative surplus-value involve the specification of commodity-owners into capitalist and wage-labourer. Having discarded the former as the material subject of scientific labour, it is self-evident that only those determined as doubly free individuals can personify the development of this moment of the production-process of large-scale industry. Thus, although not explicitly addressed by Marx, the benefit of historical hindsight makes it very easy for us to recognise how the total social capital deals with its constant need for the development of the productive powers of science, namely, by engendering a special partial organ of the collective labourer whose function is to advance in the conscious control of the movement of natural forces and its objectification in the form of ever more complex automatic systems of machinery. Whilst the system of machinery entails the progressive deskilling of those workers performing what remains of direct labour – to the point of emptying their labour of any content other than the mechanistic repetition of extremely simple tasks – it also entails the tendential *expansion* of the productive subjectivity of the members of the intellectual organ of the collective labourer. Capital requires from these workers ever more *complex* forms of labour.⁶⁵ As much as those discussed in *Capital*, these are also ‘immediate effects of machine production on the worker’. Needless to say, inasmuch as this expanded productive subjectivity is nothing more than a concrete form of the production of relative surplus-value, the exercise of the newly developed intellectual productive powers is inverted into a mode of existence of capital in its movement of self-valorisation as well.⁶⁶

In this alienated form, capital thereby produces a material transformation whose fundamental significance exceeds the production of wage-labourers simply bearing different productive attributes. What is at stake here is, first and foremost, a radical substantial transformation of the very nature of human

65. The so-called ‘deskilling thesis’, formulated in the seminal work by Braverman (Braverman 1998) is obviously a one-sided reduction of this *two-fold* movement of degradation/expansion of the productive subjectivity of the collective labourer required by the system of machinery to one of its moments. See Iñigo Carrera 2003, p. 32. One of the immediate reasons behind such a unilateral account lies, as Tony Smith points out, in its very restricted definition of ‘skill’, very much referring to *manufacturing* skills. See Smith 2000, p. 39.

66. That is, the productive powers of science take an alienated form not just *vis-à-vis* manual labourers, who face them already objectified in the system of machinery. Intellectual labourers also confront the development of science they themselves personify as an alien power borne by the product of their social labour. Moreover, the alienated nature of this development of intellectual labour is even expressed in its general scientific form, that is, in its method. In its determination as a form of the reproduction of capital, scientific knowledge is bound to represent natural and social forms as self-subsistent entities or immediate affirmations, and their relations as inevitably external ones. For an elaboration of this point, see the chapter in this book by Iñigo Carrera. See also Iñigo Carrera 1992 and Starosta 2003.

labour.⁶⁷ The latter progressively ceases to consist in the direct application of labour-power onto the object of labour with the purpose of changing its form. It now increasingly becomes an activity aimed at the conscious control of the movement of natural forces in order to make *them* automatically act upon the object of labour and, in this way, to effect its change of form. According to Marx's exposition of the system of machinery in the *Grundrisse*, *it is in the contradictory historical unfolding of this specific material transformation of human productive subjectivity that the key to the absolute limit to capital resides.*

To the degree that labour-time – the mere quantity of labour – is posited by capital as the sole determinant element, to that degree does direct labour and its quantity disappear as the determinant principle of production – of the creation of use-values – and is reduced both quantitatively, to a smaller proportion, and qualitatively, as an, of course, indispensable but subordinate moment, compared to general scientific labour, technological application of natural sciences, on one side, and to the general productive force arising from social combination [*Gliederung*] in total production on the other side – a combination which appears as a natural fruit of social labour (although it is a historic product). *Capital thus works towards its own dissolution as the form dominating production.*⁶⁸

To put it briefly, the issue here is the old question of the relation between intellectual and manual labour. More concretely, the fundamental point to grasp is the specifically capitalist form in which the antithetical movement of those two moments of living labour asserts itself with the development of the system of machinery. The revolutionary aspect of this historically-specific transformation of living labour in capitalist society is that both the scale and complexity of the production-process and, in particular, the increasingly scientific character of its organisation, make the subjectivity of the capitalist (the non-labourer) impotent to personify the now directly social labour under the rule of his or her capital. This means, in other words, that the development of the powers of intellectual labour and their exercise becomes an attribute of the 'labouring classes'.⁶⁹

67. Iñigo Carrera 2003, p. 11.

68. Marx 1993, p. 700, my emphasis.

69. On the superfluity of the capitalist, see especially Marx's concise comments in *Theories of Surplus Value* (Marx 1989a, p. 499). The complexity and scale of the co-operation of the collective worker of large-scale industry render the subjective powers of the capitalist impotent to personify in the name of his or her capital even the unproductive labour of superintendence of the productive organs of the former. All the functions of supervision, coercion and management come to be personified by a partial organ of the collective labourer. See Marx 1976a, p. 549; and Marx 1991b, pp. 510–1. The parasitic nature of the capitalist, though not yet of capital, thereby becomes increasingly concrete. And note that this expresses an alienated necessity of the accumulation of social capital itself:

The scientifically-expanded productive subjectivity of intellectual labour is, by its own nature, increasingly general or universal. The exertion of this form of human labour-power aims at the expansion of the conscious control over the *totality* of the forces of nature. Moreover, this subordination of the latter to the powers of living labour involves the comprehension of their *general* determination in order thereby to develop their *particular* technological applications in ever-evolving systems of machinery. Thus, as Marx puts it in *Capital* Volume III of in order to highlight its specificity *vis-à-vis* co-operative labour, scientific labour is, by definition, universal labour.⁷⁰

With the constitution and permanent revolutionising of this organ of the collective labourer, capital thereby engenders *another* tendency for the production of workers bearing a universal productive subjectivity. However, this universality is no longer the *empty* universality deriving from the absolute *lack* of individual productive capacities to which direct labourers are condemned. When developed into its plenitude, it becomes the rich, concrete universality of organs of a collective subject who become increasingly able consciously to rule their life-process by virtue of their capacity to scientifically organise the production-process of any automatic system of machinery and, therefore, any form of social co-operation on the basis of large-scale industry. As the productive subjectivity of workers expands, it progressively ceases to be the case that the worker's individuality vanishes 'as an infinitesimal quantity in the face of the science, the gigantic natural forces, and the mass of social labour embodied in the system of machinery'.⁷¹ For the latter *are* the direct products of the objectification of their productive subjectivity:

Nature builds no machines, no locomotives, railways, electric telegraphs, self-acting mules etc. These are products of human industry; natural material transformed into organs of the human will over nature, or of human participation in nature. They are *organs of the human brain, created by the human hand*; the power of knowledge, objectified. The development of fixed capital indicates to what degree general social knowledge has become a *direct force of production*, and to what degree, hence, the conditions of the process of social life itself have come under the control of the general intellect and been transformed in accordance with it. To what degree the powers of social production have been

the consumption of the capitalist represents a deduction of the potential surplus-value that could be devoted to its self-expansion. Incidentally, the confusion over the parasitic nature of the capitalist and that of the capital-form as such underlies Negri's views of the present, 'Post-Fordist' forms of human co-operation as carrying in their immediacy – that is, without the mediation of more material transformations – the potentiality to explode the capital-relation. See Negri 1992, pp. 65–8, and Negri 1999, pp. 156–60.

70. Marx 1991b, p. 199.

71. Marx 1976a, p. 549.

produced, not only in the form of knowledge, but also as immediate organs of social practice, of the real life process.⁷²

We saw how in *Capital* Marx focused on the ‘negative side’ of the effects of production of relative surplus-value through the system of machinery upon the material forms of the productive subjectivity of the working class. The historical emergence of the social necessity for the constitution of a ‘fully-developed social individual’ thus appeared as an abstract possibility, whose connection to capital’s development of machine-based production seemed to be completely external. Conversely, we can appreciate now how in the *Grundrisse* Marx posits capital’s relentless tendency to ‘call to life all the powers of science and of nature, as of social combination and of social intercourse’⁷³ as necessarily engendering the historical becoming of that concrete universal subjectivity itself.

No longer does the worker insert a modified natural thing [*Naturgegenstand*] as a middle link between the object [*Objekt*] and himself; rather, he inserts the process of nature, transformed into an industrial process, as a means between himself and inorganic nature, mastering it. He steps to the side of the production-process instead of being its chief actor. In this transformation, it is neither the direct human labour he himself performs, nor the time during which he works, but rather the appropriation of his own general productive power, his understanding of nature and his mastery over it by virtue of his presence as a social body – it is, in a word, the development of the social individual which appears as the great foundation-stone of production and of wealth.⁷⁴

Moreover, and here in accordance with *Capital*, he presents the latter as the one whose further expansion eventually clashes with its alienated capitalist social form and, therefore, as the material form of productive subjectivity that carries as an immediate potentiality the necessity for the ‘creation of the new society’. Hence, Marx continues:

The *surplus labour of the mass* has ceased to be the condition for the development of general wealth, just as the *non-labour of the few*, for the development of the general powers of the human head. With that, production based on exchange value breaks down, and the direct, material production process is stripped of the form of penury and antithesis.⁷⁵

72. Marx 1993, p. 706.

73. Marx 1993, p. 706.

74. Marx 1993, p. 705.

75. Marx 1993, pp. 705–6.

It might seem that Marx is here substituting the intellectual labourer for the manual labourer as the revolutionary subject. However, the point is that the key does not consist in abstractly opposing intellectual and direct manual labour in order to privilege one over the other, but in grasping the contradictory forms in which capital historically develops these two necessary moments of the labour-process. Since Marx's exposition in the *Grundrisse* is only concerned with the *general* tendency and, more specifically, its historical result – that is, with the movement of 'bourgeois society in the long view and as a whole'⁷⁶ – he does not pay much attention to the contradictory forms in which the latter asserts itself. However, it is clear that in the historical unfolding of the tendency for the progressive objectification of all direct application of human labour-power onto the object of labour as an attribute of the machine, capital actually *reproduces and exacerbates* the separation between intellectual and manual labour.⁷⁷

In effect, inasmuch as capital's conversion of the subjective expertise of the direct labourer (both intellectual and manual) into an objective power of the machine is not an instantaneous event but only done by degrees, every leap forward in the abolition of manual labour brought about by the revolution in the material forms of the process of production is realised by actually multiplying the spaces for the exploitation of manual living labour. In fact, the new technological forms themselves might generate as their own condition of existence the proliferation of a multitude of production-processes still subject to the manual intervention of the labourer, whether as an appendage of the machine, as a partial organ in a manufacturing division of labour or even in the form of 'domestic industry'. Thus, until the conditions for the (nearly) total elimination of manual labour are produced, direct labour as an appendage of the machine and/or the

76. Marx 1993, p. 712.

77. One of the central weaknesses of recent theories of 'immaterial labour' or 'cognitive capitalism', which heavily rely on the 'Fragment on machines', is their 'stageist' reading of that text. See, for example, Virno 2007; Lazzarato 1996; Vercellone 2007. In other words, those authors use those passages from the *Grundrisse* for a formalistic specification of a qualitatively different stage of capitalist development that is said to supersede not only large-scale industry but the real subsumption as well: the epoch of the 'general intellect'. Worse still, those theories unmediatedly – hence speculatively – apply the essential tendency and finished form described in the *Grundrisse* onto contemporary concrete forms of realisation that still represent its negation. The result is that they overlook or downplay the contradictory movement of expansion/degradation and universalisation/particularisation entailed by current material forms of the real subsumption. As we have seen, what the 'Fragment on machines' unfolds is not the abstract opposite of the determinations of the productive subjectivity of large-scale industry but their more concrete development. The significance of that undoubtedly essential text is therefore *systematic*. And, incidentally, so is that of the distinction between the three different forms of the real subsumption presented in *Capital* and that between formal and real subsumption. For a forceful case against the 'stageist' reading of those chapters of *Capital*, see Tomba 2007.

division of labour of manufacture tend to be reproduced under the new conditions and with even more degraded forms of productive subjectivity and harsher conditions of capitalist exploitation.⁷⁸

Yet, it is certainly the case that this internal differentiation of the collective labourer on the basis of the respective forms of productive subjectivity is the self-negating form in which the *abolition* of that separation is realised in the historical process. Thus, through the very exacerbation of their separation, capital tendentially abolishes the qualitative and quantitative weight of manual labour in the process of the reproduction of social life, thereby converting the essential moment of living labour into an intellectual process. In this way, capital's transformation of the labour-process eventually reaches a point in which the separation between intellectual labour and what is now a quantitatively and qualitatively insignificant amount of manual labour, cannot materially obtain as a form of organising the life-process of humanity. The development of the material productive forces of society can only assert itself through the embodiment of the intellectual powers of social production in the individual subjectivity of every partial organ of the now directly social productive body. Moreover, this incorporation of the powers of the 'general intellect' into every individual worker must now have the form of objective social knowledge – namely, science – instead of being the product of the immediate subjective productive experience of the labourer (as was the case of independent handicraft-production). As we shall see below, it is the consciously organised political action of the *whole*

78. This is illustrated by Marx in section eight of the chapter on 'Machinery and large-scale industry' in *Capital*. There he shows how the production of relative surplus-value through the system of machinery reproduces modern manufacture, handicrafts and domestic industry. In this way, capital not only revolutionises the determinations of the social existence of those workers incorporated into large-scale industry but also of those of the sections of the working class still working under the division of labour in manufacture or domestic industry. The latter forms of the social production-process persist in their survival only through the imposition of the most brutal forms of the exploitation of the workers. However, Marx makes clear that the subsistence of manufacture and domestic industry is always provisional, even if it appears to hang on for long periods of time. The general tendency of capital is for the total development of large-scale industry. Moreover, Marx's discussion makes clear that the working class does not have to 'sit and wait' until the limit for the subsistence of manufacture is reached – a limit given by the extent to which the over-exploitation of labour-power compensates for its relative lower productivity of labour *vis-à-vis* large-scale industry. Inasmuch as the struggle for the shortening of the working day succeeds in forcing its implementation in the branches of production where manufacture persists, it accelerates the development of large-scale industry by not allowing the selling of labour-power below its value and, therefore, by reducing the capitalist limit to the introduction of machinery. Here we have a clear instance of the way in which progressive politics mediates revolutionary politics, the former being the concrete form of the development of the material determinations for the emergence of the latter.

working class – whatever its productive subjectivity – that is the necessary form in which this latter material transformation is realised.⁷⁹

In its formally boundless movement of self-valorisation, capital therefore cannot stop in the historical production of universal productive subjects. At the same time, this constant revolution in the material forms of human productive subjectivity can only take place through the progressive socialisation of private labour, thereby positing the extension of the scope of the conscious regulation of directly social labour as an immediate necessity for capital's production of relative surplus-value. Thus, through the development of large-scale industry, capital works towards the historical emergence of the other precondition for 'really free working' as well:

In the production process of large-scale industry . . . just as the conquest of the forces of nature by the social intellect is the precondition of the productive power of the means of labour as developed into the automatic process, on one side, so, on the other, is the labour of the individual in its direct presence posited as suspended individual, i.e., as social, labour. Thus the other basis of this *mode of production falls away*.⁸⁰

On the two-fold basis of the expansion of the scientific productive powers of the 'social intellect' and of the determination of human labour as directly social, capital moves right towards reaching its absolute historical limit as a social form. This limit is not reached when capital-accumulation *ceases* to develop the material productive forces of society as, following Trotsky, orthodox Marxists would have it.⁸¹ On the contrary, capital clashes with its limit when the very same alienated socialisation and scientific universalisation of the powers of human labour through the production of relative surplus-value begets, *as its own immanent necessity*, the development of the productive forces of society in a particular material form, namely: the fully conscious organisation of social labour as the *general* social relation regulating the reproduction of human life and, therefore,

79. Besides, it goes without saying that, although the workers bearing an expanded productive subjectivity express the *movement towards* the development of a universal individuality, they do so within the limits of capital as an alienated social form. In other words, it is not the *immediate actuality* of the material forms of their productive subjectivity that constitutes the kind of 'rich and all-sided individuality' discussed by Marx (1993, p. 325). As much as they are workers with a degraded productive subjectivity, they not only have to change 'society' but also undergo a process of self-change in the course of the revolutionary process. Hence, *both* organs of the collective labourer have to 'get rid of the muck of ages' imposed by the determination of human subjectivity as a concrete form of the reproduction of relative surplus-value. More concretely, this entails the *transformation* of intellectual labour (that is, of the mode of scientific cognition or the kind of scientific method) and its *generalisation*. See note 66 above.

80. Marx 1993, p. 709.

81. Trotsky 2002, pp. 1–2.

as an attribute borne by every singular productive subjectivity comprising the collective labourer. Under those circumstances, the further leap forward in the material productive forces of society – dictated by the most immediate necessity of capital itself, that is, the production of relative surplus-value – comes into conflict with capitalist relations of production. Translated into our mode of expression, this classical Marxian insight can only mean the following: the *alienated* social necessity arises for the human being to be produced as a productive subject that is fully and objectively conscious of the social determinations of his/her individual powers and activity. Thus, he or she no longer sees society as an alien and hostile potency that dominates him/her. Instead, he or she consciously experiences the materiality of social life (that is, productive cooperation) as the necessary condition for the development of the plenitude of his or her individuality, and therefore consciously recognises the social necessity of the expenditure of his or her labour-power in organic association with the other producers. However, this form of human subjectivity necessarily collides with a social form (capital) that produces human beings as *private and independent individuals* who consequently see their general social interdependence and its historical development as an alien and hostile power borne by the product of social labour. The determination of the material forms of the labour-process as bearers of objectified social relations can no longer mediate the reproduction of human life. *Capital-accumulation must therefore come to an end and give way to the free association of individuals:*

But with the suspension of the *immediate* character of living labour, as merely *individual*, or as general merely internally or merely externally, with the positing of the activity of individuals as immediately general or *social* activity, the objective moments of production are stripped of this form of alienation; they are thereby posited as property, as the organic social body within which the individuals reproduce themselves as individuals, but as social individuals. The conditions which allow them to exist in this way in the reproduction of their life, in their productive life's process, have been posited only by the historic economic process itself; both the objective and the subjective conditions, which are only the two distinct forms of the same conditions.⁸²

Thus, it is the historically-determined necessity for the fully-developed and socialised universality of the productive subjectivity of the workers, beyond its capitalist 'integument' but *generated as an immanent determination of the alienated movement of capital itself*, that is realised in the concrete form of the communist revolution. This suggests that *the revolutionary political consciousness of the*

82. Marx 1993, p. 832.

*working class can only be a concrete expression of their productive consciousness.*⁸³ What the political action of the self-abolishing proletariat realises (its content) is, fundamentally, the transformation of the materiality of the productive forces of the human individual and, *therefore*, of their social forms of organisation and development. To put it differently, it is about a *material* mutation of the production-process of human life, which takes concrete shape through a transformation of its *social* forms which, in turn, expresses itself through a conscious *political* action, namely, a revolution. Thus, the issue here is not one of finding the external ‘objective conditions’ that trigger or facilitate the development of a self-determining political action, but of unfolding the inner or immanent material and social determinations of capital-transcending conscious practice. In other words, at stake here is the *content and form* of the necessity to abolish the capital-form.

To recapitulate, we can now appreciate the significance of the ‘Fragment on machines’ from the *Grundrisse*. Although clearly in an unsystematic fashion (after all, they are only research-manuscripts), that earlier version of the critique of political economy contains the elements for the systematic unfolding of the plenitude of the determinations that constitute the immanent *content* of capital-transcending transformative practice that *Capital* only partially achieves. However, it is actually the latter text that unfolds the necessity of its *form*, namely, the conscious political action of the whole working class. As we have seen, through the discussion of the factory-acts, Marx unfolds the determination of the political action of the working class as the necessary mediation, in the form of a consciously organised collective action, for the imposition of the *general* conscious regulation of social labour in the capitalist mode of production; that is, as a concrete form of the essentially *unconscious* – hence inverted – organisation of social life through the capital-form. But furthermore, we saw above that the struggle of wage-labourers as a class was also the necessary form in which social capital’s need for workers with an increasingly universal productive subjectivity, resulting from the movement of the *real* subsumption in the form of large-scale

83. It also suggests that revolutionary action is an expression of an alienated subjectivity. In other words, the abolition of capital is not the product of an abstractly free, self-determining political action, but one that the workers are *compelled* to do as personifications of the alienated laws of movement of capital itself. See Iñigo Carrera 2003. What sets capital-transcending political action apart from capital-reproducing forms of the class-struggle is its specific determination as a collective action that is fully conscious of its own alienated nature, of personifying a necessity of social capital. However, by becoming conscious of their determination as a mode of existence of capital, revolutionary workers also discover the historic task that as fully conscious yet alienated individuals they have to undertake: the supersession of capital through the production of the communist organisation of social life. Revolutionary subjectivity therefore organises an alienated political action that in the course of its own development liberates itself from all trace of its alienated existence.

industry, asserted itself. True, in Marx's exposition in Chapter fifteen of *Capital* the class-struggle does not transcend its determination as a mediating moment of social capital's reproduction. This is because he does not unfold its immanent material content – the socialisation and universal development of human productive subjectivity – up to its absolute limit. But this is precisely what the *Grundrisse* do; that is, they do not unfold a *different* content but develop a more complex shape of that content itself. *A fortiori*, its concrete mode of realisation remains the same: the struggle of wage-labourers as a class. A struggle, however, that is no longer determined as form of capital's reproduction. As an expression of the plenitude of its content, the political action of wage-labourers now becomes determined as the mode of existence of capital-transcending human practice. Hence the general determination of the communist revolution: to be the political form taken by the historical production of the subjectivity of the 'rich individuality which is as all-sided in its production as in its consumption, and whose labour also therefore appears no longer as labour, but as the full development of activity itself'.⁸⁴

Conclusions

This chapter has argued that, in their unity, the *Grundrisse* and *Capital* provide the elements for the scientific exposition of the determinations of capital leading to the social constitution of the revolutionary working class. This exposition must actually comprise the reproduction in thought of the concrete unity of *all* the determinations of social existence implied in the necessity for the abolition of capital, starting with its simplest form, namely, the commodity. However, for obvious reasons of space, the discussion centred on the specific form of capital that carries the necessity of its own supersession as an immediate potentiality. That form, this paper has argued, lies in the fully developed shape taken by the real subsumption of labour to capital: the system of machinery.

As we have seen, Marx's treatment of large-scale industry in *Capital* differs from the exposition he had initially formulated in his research-manuscripts known as the *Grundrisse*. This has led many scholars to see the two perspectives as somehow incompatible, maybe even reflecting a change of mind on the part of Marx, from an early optimistic view of the emancipatory potentialities of the forms of the real subsumption to a more pessimistic view of the latter as yet another expression of the despotic rule of dead over living labour. This paper has offered a different reading of this aspect of Marx's intellectual development. Whilst it is certainly true that Marx's exposition changed from the *Grundrisse* to

84. Marx 1993, p. 325.

Capital, this difference does not express two inconsistent views of the determinations of the productive subjectivity of large-scale industry. Rather, each text actually centres the exposition on the development of *one* of the *two essential contradictions* that characterise the most complex form of the real subsumption and whose development constitutes the immanent ground of revolutionary subjectivity. In *Capital*, the exposition focuses on the ‘absolute contradiction’⁸⁵ between *particularity and universality* of the development of productive subjectivity, leading Marx to emphasise the material *degradation* of individuality of the wage-labourer of large-scale industry. By contrast, in the *Grundrisse* Marx focuses his attention on the development of the contradiction between the *intellectual and the manual* moments of the production-process under the rule of capital, leading him to unfold the tendency for the scientific *expansion* of the subjectivity of the doubly free labourer. Both contradictions are, however, two sides of the same coin: the alienated form in which human beings produce the materiality of their species-being at a certain stage of development and on the basis of specific historical presuppositions.⁸⁶

But it is an insipid notion to conceive of this merely *objective bond* as a spontaneous, natural attribute inherent in individuals and inseparable from their nature (in antithesis to their conscious knowing and willing). This bond is their product. It is a historic product. It belongs to a specific phase of their development. The alien and independent character in which it presently exists *vis-à-vis* individuals proves only that the latter are still engaged in the creation of the conditions of their social life, and that they have not yet begun, on the basis of these conditions, to live it.⁸⁷

As we have seen, this development does not only involve the *formal* inversion between subject and product of social labour but also the *material* mutilation of the productive individuality of wage-labourers. However, Marx was also clear about the *relative historical necessity* of those forms, if only as a *vanishing moment* in the world-historical process of development of the materiality of ‘really free working’ and, hence, in the production of the necessity of their own supersession.⁸⁸

85. Marx 1976a, p. 617.

86. Those historic presuppositions entail a degree of development of the productive individuality of the human being historically attaining ‘adequate classical form’ in the form of the *freedom and independence* of the *isolated* individual labour of the peasant and the artisan, that is, on the basis of the *dissolution* of all relations of personal dependence. See Marx 1976a, p. 927, and Marx 1993, p. 156. The material specificity of capital, which it formally achieves in an alienated form, consists, precisely, in the socialisation of free but isolated labour. Marx 1976a, p. 927.

87. Marx 1993, p. 162.

88. *Ibid.*