LABOUR TIME, WORK MEASUREMENT AND THE COMMENSURATION OF LABOUR

P.S. Taylor

Managerial work study directed at the intensification of labour characterises specifically capitalist production. According to the British Institute of Management standard textbook, 'work study' consists of procedures for 'method study' and 'work measurement' which "can be used in any situation where human work is performed" (Currie, 1977, p. 48). Do such procedures provide the basis for a *socialist* organisation of production? Th That is, do such procedures, in effect if not intent, provide a 'socialist form of commensuration of labour'?

Sohn-Rethel (1) has argued that "the mode of commensurating labour . . . . by the social exchange process which characterizes capitalist production" and the mode of commensuration initiated by F. W. Taylor ("The Father of Scientific Management" [Currie, 1977, p. 21]) "are diametrical opposites to each other in every vital characteristic " (Sohn-Rethel, 1978, pp. 166–172). How does Sohn-Rethel arrive at this representation of the "Taylorian mode of commensurating labour"? The essential feature of Taylor's scheme is, for Sohn-Rethel, "his method of accurate and scientific study of unit times", which was declared by Taylor to be "by far the most important element in scientific management". And, "Taylor's aims in analysing manual operations were, in the first place, to find out how the studied operation can be done with least waste of time and minimal effort and fatigue; then to norm the operation as a composite of strictly repetitive and standard parts; to reduce these parts to the smallest particles or 'units' of motion, assumed to be homogeneous in all manual operations; to time these units with the precision of fractions of a second; finally to use these 'unit times' as a foundation of the job evaluation for fixing correct wage and bonus rates " (Sohn-Rethel, 1978, p. 170). This representation Sohn-Rethel derives principally from Taylor's "The Art of Cutting Metals", but a somewhat divergent representation may be derived from Taylor's "A Piece Rate System, being a step toward partial solution of the labor problem" (Taylor, 1895).

What was the 'labor problem' identified by Taylor? Briefly stated the problem was the 'demoralization' and 'unionization' of at least certain American workforces consequent on managerial, or employer, piece-rate cutting associated "systematic soldiering" or "restriction of output" on the part of workers. Taylor was concerned to reject any argument that such rate cutting and restriction of output were a *necessary* outcome of employer-labour relations. For Taylor, the apparently irreconcilable conflict between output maximisation for wages paid on the part of employer and wage maximisation per unit of output on the part of workers *could* be reconciled. Such reconciliation could be achieved, argued Taylor, since employers *could* afford to pay *permanently* higher wages *provided* such wages secured correspondingly higher levels of output. And the 'differential piece-rate' was introduced as the specific means whereby this reconciliation could be secured. Higher rates per unit of output were to be paid for production above a specified standard level and lower rates per unit of output below this standard level. Such a system, Taylor argued, would have the effect of providing for the payment of permanently higher wages for those workers producing at above the standard level; differentiating the workforce in terms of capacities to labour at specific levels and in terms of associated wage levels; and driving away all but the best workers. Such a system would, Taylor argued, serve admirably to subvert any emergent *solidarity* in a workforce through engendering *individuality* and, hence, provide at least a partial solution to 'the labor problem' (2).

But, Taylor also argued, such a system must be securely founded on 'unit times' as determined by employers or management *independently* of *actual* work performance time, and 'worker knowledge' of work processes. That is, direct, 'non-worker mediated' managerial knowledge of 'unit times' was regarded as a *necessary pre-condition* for the imposition of performance and output standards, the determination of *individual* wage levels and the general differentiation and individualisation of a workforce.

The process whereby such 'unit times' were to be derived may be presented schematically through a consideration of the machine metal working example deployed in various representations of Taylor's activities. The various elements in any person/machine metal working process may be identified as the nature of the metal to be worked, the tool, the speed of the machine and the speed of the attendant human motions, and so on. To the extent that the 'human variable' cannot be more or less directly controlled by the "objective means", or conditions of the work situation, then the "subjective conditions for the condensation of labour" must be realised through some "method of payment" which is intended to ensure that "the worker really does expend more labour power" (Marx, 1976, pp. 534–5). Now, for management any calculation of that somewhat elusive notion of "the quickest time for the job" would present management with at least the possibility of imposing this time as a production standard against which any actual performance could be evaluated. To guard against such an invidious imposition workers are likely to seek to ensure that 'the quickest time for the job' remains an intangible notion, decently shrouded in obscurity, at least as far as management is concerned. Hence, the concern of 'scientific management' is to *impose* 'the quickest time for the job'

by posing the question of the quickest time, and the conditions necessary to secure it, and providing an answer under circumstances as far removed as possible from the contaminating constraints of any actual factory floor. In Taylor's experience the crucial questions facing any machine metal worker related to the speed at which it was necessary to work, to run the machine, *in order to secure a certain level of wages* (3).

But Taylor sought to impose a different order of priorities. He sought to secure the conditions under which the essentially *managerial* question – valorisation question – of the quickest time for the job was directly *posed, answered* and *imposed by management*. Naturally, this essentially managerial problem was presented in Taylor's writings as a 'universal human problem'. Thus, we are informed that the crucial questions "which face every machinist each time that he does a piece of work on a metal cutting machine are, 'In order to do the job in the quickest time, at what cutting speed shall I run my machine', and 'What speed shall I use?' " (Taylor, 1964, *The Principles of Scientific Management*, p. 106). Taylor recounts, as his various interpreters continue to recount, that answers to such questions involved him and his associates in an extended series of investigations, ranging through a more or less detailed scrutiny of the variable elements of the person/machine metal working situation. In principle, each of these variable elements was susceptible to scrutiny, respecification and, ultimately at least, precise managerial control. Without such control, the speed of particular work processes would remain the prerogative of workers rather than management, or, what was regarded as even worse, an uneasy coalition of workers and management, regardless of, or even because of, the particular method of payment in operation.

More specifically, Taylor recounts that over a period of twenty-six years he and his associates conducted investigations addressed to the problem of metal cutting speed and feed of the machine tool. Answers to these problems involved the identification of twelve independent variables and the determination of their interactive effects. Such extended activity was eventually materialised in a slide rule ensuring that "all these intricate problems can be solved in less than half a minute by any good mechanic, whether he understands anything about mathematics or not" (Taylor, 1964, *The Principles of Scientific Management*, p. 111). Further, having determined the optimum speed for the machine component of the operation, comparable effort was expended with the object of determining the optimum speed of the attendant human motions. Here the essential strategy was to analyse any given job, in terms of *strictly necessary* component motions, in order to determine the optimum speed for each 'component motion', and thereby calculate an optimum overall *time for the job*. The outcome of such investigations was intended to be a detailed instruction card which not only specified *how* a given job must be performed but also *how fast* it could, even should, be performed. Thus, under the rule of scientific management every machine metal worker was to be confronted throughout the daily performance of his tasks with an impelling manifestation of *managerial knowledge* of just how, and how fast, a job could, and should, be done (2).

Now, although Sohn-Rethel suggests that, in respect of this method of

deriving 'unit times', "some of these features have undergone more or less considerable modification since the days of Taylor", he also asserts that "It is still the method of direct time and motion study" (Sohn-Rethel, 1976, p. 170). This assertion may be scrutinised through a consideration of the concepts and procedures outlined in the standard British managerial textbook entitled *Work Study*. Here we find that 'method study' provides the necessary procedures for a managerial specification of *how* a job should be done, and 'work measurement' the procedures for a managerial specification of *how fast* a job should be done. In 'work measurement' the crucial concepts are 'units of work' and 'standard performance' which may be located in the following extract:

> "The unit for measuring work is founded on the notion that the human work content of many different types of job can be expressed quantitatively in terms of a common unit. In this unit provision is made both for the effort called for by the job and an appropriate rest allowance. . . . . (which) is always related to the concept of a standard rate of working. In practice this is represented by the average effectiveness at which a qualified worker will *naturally work* on a job when s/he knows and adheres to a specific method and is *suitably motivated*" (emphasis added, Currie, 1977, p. 140).

The procedures specified for the determination that any observed workers are indeed 'working naturally' and are 'suitably motivated' are indicated in the following extract:

> "By standard performance is meant the optimum rate of output that can be achieved by a qualified worker as an average for a working day or shift, due allowance being made for the necessary time required for rest. *(An idea of what this means in practice can usually be obtained by observing the performance of workers whose output is paid for on a piece-work basis.)*" (Currie, 1977, p. 139, emphasis added.)

Now, not only does such a method of observation introduce an essential circularity into the measurement procedures (by *presupposing* the existence of what the procedures are designed to secure—a piece-work system which produces 'naturally working' and 'suitably motivated' workers) it also abrogates the basic protocols of Taylorism. For the whole import of Taylor's argument was to the effect that in order to establish 'scientific management' it was necessary to assume that workers, particularly on piece-wages, were 'restricting their output' in order to optimise their wages in relation to given levels of output and work processes. Accordingly, any system of payment, if it was to operate as an adequate means of managerial control of "the one element which is most vital both to employer and workman . . . . .the speed at which work is done"(Taylor, 1964, *Shop Management*, p. 45), must be founded on 'unit times' established *independently* of the actual operation of any wage system on the shop floor. Otherwise, the whole system rests insecurely on "ignorance and deceipt", and control of the speed of work passes in effect to the workers, or an

uneasy coalition of workers and management. In Taylor's terms, any system of management founded on the procedures specified in *Work Study* would represent 'non-scientific management'.

It should be noted that this circularity is not circumvented through the specification of "rating procedures" or "analytic/synthetic estimation procedures" which translate "observed times" into "basic times"(3). For example, according to the International Labour Office *Introduction to Work Study*, "Rating is the assessment of the worker's rate of working relative to the observer's concept of the rate corresponding to standard pace" (International Labour Office, 1969, p. 258). But this concept of 'standard pace' or 'standard performance' still involves the notion of "adequate motivation". For, "standard performance is the rate of output which qualified workers will *naturally* achieve without over-exertion as an average over the working day or shift provided they know and adhere to the specified method and provided they are *motivated* to apply themselves to their work " (International Labour Office, 1969, p. 259, emphasis added). Further, it is argued in this particular text that if time standards are to be useful for managerial purposes they must be more or less acceptable to the majority of workers in any enterprise. Hence the expressed desirability of timing workers 'on the shop floor' rather than under "laboratory conditions". The essential circularity of the concepts and procedures of 'work measurement' remains. In addition, there is the further consideration that, as various studies of 'restriction of output' have revealed, the outcome of job-timing on the shop floor is likely to be a process of mutually conditioning calculation on the part of those being timed and those undertaking the timing. Workers attempt to secure what they regard as a reasonable time and price for a particular job through appropriate performance, and the time-study men make allowance for this in their calculations. This introduces a practical circularity into the measurement procedures over and above the conceptual circularity earlier identified (6).

But is the adoption of such 'non-scientific' managerial procedures contingent—something "which can be ascertained only by analysis of the empirically given circumstances", or necessarily entailed in "the specific economic form in which unpaid surplus-labour is pumped out of the direct producers"? (Marx, 1972, pp. 791–2). In *Capital* the intensification of labour is considered as a particular method of producing surplus-value (7). Marx argues that machinery provides an "objective means" for the intensification of labour through an increase in the speed at which machinery is run and/or the number of machines which workers are required to operate. In addition, the method of payment represents the main 'subjective means' where labour is intensified. Briefly, Marx argues that the piece-wage form is "most appropriate to the capitalist mode of production" because it engenders an individualisation of workers which "enables the capitalist to raise the normal degree of intensity of labour more easily", given that the piece-wage provides "an exact measure of the intensity of labour" (Marx, 1976, pp. 694–8). But under specifically capitalist conditions of production—that is, more or less constant transformation of the conditions, methods and means of production, the piece-wage as a means of labour

intensification is rendered essentially problematic. This, as has been noted, was the problem to which Taylor directly addressed himself. However, to return to the metal working example, if more or less precise managerial knowledge of the variables comprising the work situation is supposed, then is not any system of piece-wages redundant? Why pay piece wages when *time* is a precise measure of how much of given commodities can be produced?

Taylor's response to such a question was couched in terms of the need to 'adequately motivate' workers, even when management was in a position to specify precisely, and thereby control, particular work processes. Indeed, Taylor argued in general that scientific management required as a condition of its satisfactory implementation a 'psychological transformation' on the part of both management and workers. And the material means envisaged for securing such a transformation was principally the enhanced profitability, or extra increments of surplus accruing consequent on the implementation of the procedures of scientific management. Such was the envisaged increase in surplus, the attention of both management and workers would be focused firmly on its *size* rather than its *distribution* (Taylor, 1964, *The Principles of Scientific Management* espec. pp. 29–30). That is, the increased surplus accruing in respect of a given capital would enable the agents controlling that capital to secure the 'adequte motivation' of the 'attendant workforce', principally through the means of above average wages. However, scientific management necessarily proceeded through the reorganisation of specific work processes, in order to extend managerial control over such processes, according to the valorisation requirements of *individual* capitals. Such procedures were relatively costly to implement, but it was clearly envisaged that they would, of competitive necessity, become generalised throughout various branches of production. However, such a generalisation would tend to eradicate the advantage of any individual capital—eradicate any extra increment of surplus accruing to an individual, scientifically managed, capital. That is, the intensification of work in respect of given work processes and associated individual capitals would, when generalised throughout a given branch of production, result in 'intensity of labour' ceasing to operate as a measure of 'extensive magnitude' (Marx, 1976, pp. 661-2). What signifies then is the *labour time socially necessary* for the production of given commodities—labour of *variable* time and *constant* intensity (8).

If additional increments of surplus are not forthcoming, then the 'adequate motivation' of the workforce remains essentially problematic. To the extent that the labour power requirements corresponding to scientific management specified work processes cannot be secured, then these specifications become more or less redundant. In certain circumstances and conditions it may be more effective to secure managerial control over the speed of work through other means (9). Indeed, it may be supposed that time and motion study functions, more or less, to *legitimate* rather than to *specify* in respect of at least certain work processes. That is, it may be argued that it intervenes in the 'effort bargaining' between management and workers as a 'negotiable datum' rather than the 'objective datum' envisaged by scientific management (10). For Taylor, this signifies 'non-

scientific management', and the worst of all possible worlds, ". . . .divided control of the speed with which work shall be done" (Taylor, 1964, *Shop Management*, pp. 44–5).

It may be argued then, that whatever the merits of Taylorism at the level of individual capitals, it is contradictory at the level of capital in general. Indeed, it cannot secure its own necessary material conditions of existence, in the sense of both *generating* and *sustaining* the extra increments of profit necessary to secure the 'psychological transformation', and accordingly the 'adequate motivation' and 'natural working' of the workforce. Hence, the continuing existence, indeed, prevalence, of "non-scientific" managerial forms, and the *non*-establishment of 'unit-times' according to Taylor specifications, as a basis for capitalist forms of work organisation. The 'unit times' derived by the concepts and procedures of contemporary work study and then an amalgam of 'analytic/synthetic estimation', based on identified 'basic human motions' and direct observation of actual work performances suitably 'discounted' through 'rating' procedures. However, it is important to note that to argue against Sohn-Rethel that the 'pure Taylorian unit times' are not in fact the 'unit times' derived by contemporary time and motion study, or work study, is *not* to argue that the former possess any 'universal human validity' which is lacking in the latter. On the contrary the argument is intended to demonstrate that whatever their forms of derivation, 'unit times' are determined by the requirements of a particular form of production of surplus value in given empirical circumstances. And, whatever the particular amalgam of observation and analytic/synthetic estimation, the derived 'unit times' are forms of measurement which are socially valid, therefore 'objective', solely in respect of capitalist relations of production—specifically, valid solely in terms of the production of relative surplus value through *the intensification of labour.* They possess no other social validity or objectivity.

In effect, Sohn-Rethel argues against such specific, historical, social validity of the 'unit times' of 'scientific management' through a representation of these 'unit times' as in some, more or less unspecified, sense constituting times relating to an 'economisation of human motions' and a 'minimisation of effort and fatigue'. That is, Sohn-Rethel's argument universalises the validity of the 'unit times'. However, and setting aside for the moment the question of whether 'human effort and fatigue' can be co considered in any 'universal human' sense, it is quite clear from the writings of Taylor that even the 'unit times' derived according to the protocols of Taylorism were *not intended* to be of this nature. For Taylor and his associates set aside the question of the effort and fatigue involved in work processes in favour of the question of how much of given commodities could be produced by certain work processes under optimum conditions. The question of the relationship between the effort involved in specific work processes was set aside precisely because investigations did not, and were considered unlikely to, reveal a relationship between effort and output which would contribute towards a managerial specification of production standards and an extension of managerial control over work processes (12). Work processes were to be "method studied" and where

necessary re-organised according to the requirements of exerting managerial control over these processes, *not* to the requirement of effort and fatigue minimisation. That is, 'method study' first in order to derive a managerial specification of *how* work could be done and *then* "work measurement" in order to derive a managerial specification of *how fast* the "methodically" organised work *should* be done. *If* the object of the exercise was a minimisation or economisation of *work* then there would be a reversal of the order of these procedures. First, it would be necessary to examine particular work processes to determine how much work is entailed in particular operations and, on the basis of this determination, to organise work processes accordingly. But it is quite apparent that this is *not* the concern of 'work study'. "Effort", in the fatigue sense, is more or less irrelevant, for the same reasons that it was irrelevant for Taylor, because what is of prime concern is managerial control over work processes, regardless of the work content of these processes. What is solely relevant for management is 'effort' in the sense of a worker's degree of 'application' to managerially specified work tasks. Thus, when Sohn-Rethel states that "Taylor's aims in analysing manual operations were . . .to find out how the studied operation can be done with the least waste of time and minimal effort and fatigue" (Sohn-Rethel, 1978, p. 170), this is a substantial misrepresentation of the real nature of Taylorism. Indeed Sohn-Rethel's various arguments do not provide the basis for a materialist critique of scientific management and work study. They appear inherently ambiguous and contradictory. Take for example the following core of Sohn-Rethel's arguments on 'time and motion study'. "In time and motion study . . . . . quantifying standards which are rooted in the sphere of dead labour relations come to be applied directly to live labour. Since labour is placed under the microscope, so to speak, and 'reduced' to 'unit times', i.e. the precise assessment of time absorbed by the smallest elements of which a particular kind of work under review is composed as a strictly repetitive performance of the worker, cleared from waste. All qualitatively different kinds of live labour occurring in a given labour process are thus expressed as commensurate isolates", in order to "yield the mathematically calculable maximum of output per time unit" (Sohn-Rethel, 1976, p. 38). Now, this precisely identifies the organisation of work through the measurement of labour times and the application of "value standards derived from commodity exchange" which, as such, constitutes a form of "measurement of human and technological functions in their combined productive application", but depends crucially on the "labour time standard of labour commensuration" and, as such, *cannot* "serve as the basic economic regulative or the organisation of the entirety of social production" (Sohn-Rethel, 1976) for the purposes of any *socialist* organisation of social production. Further, when it is stated that "It amounts, of course, to nothing more than a pretence to proclaim the arbitrarily fixed time rates for a job (in units or no units) as norms of independent validity—as if they were extracted miraculously from the bosom of nature or even represented some prescience of the intellect" (Sohn-Rethel, 1978, p. 154), such a statement is deprived of all its potential strategic force because Sohn-Rethel has failed to specify the precise nature of these 'unit times' and

hence their very specific social validity, inextricably bound up as they are with the intensification of labour under capitalist conditions of production (13).

One important question raised by the preceding argument is whether *work* can in fact be measured. Now, various studies of 'output restriction' have clearly revealed that, in at least certain circumstances and conditions, workers do engage in processes of *measuring work*. Such processes are socially conditioned in various ways and, under conditions of wage labour, are likely to entail a calculation of 'effort-values' in monetary terms (14). Nevertheless, what is involved is an essentially *social process of work measurement b*
measurement by workers actually engaged in specific work processes. And it is further apparent that work is something which is experienced, calculated, measured, *socially*, in various forms according to the particular conditions of individuality and solidarity prevailing in actual cooperative work processes (15). That is, the particular *form* of social cooperation constituting certain work processes determines the work-effort and fatigue entailed in such processes. It follows that the work entailed in specific work processes can only be measured by the actual workers engaged in such processes. That is, work measurement is a necessary constitutive component of any cooperative productive activity and is essentially a social process carried on by people as essentially 'social animals' (Marx, 1976, p. 444). It also follows that such forms of work measurement are unacceptable for managerial purposes, indeed inaccessible to management.

In differentiating managerial 'work measurement' and workers' measurement it is important to recognise that although any process of production can be considered "from two distinct points of view: (1) as *labour process*, (2) as *valorization process*", it is nevertheless implicit that the labour process is single and indivisible. The work is not done twice over, once to produce a suitable product, a use-value, to transform the means of production into products and a second time to generate *value* and *surplus-value*, to *valorise value*. Work is contributed only in the definite, concrete, specific form, manner, mode of existence in which it is purposive activity, that can convert the means of production into a specific product" (Marx, 1976, p. 991, original emphasis). As purposive activity, *work* cannot be measured *independently* of the purpose, meaning, social significance it has for the worker. Such considerations are indeed irrelevant in terms of the process of valorisation. But, *labour* can be measured. Motions may be analysed in abstract to provide a specification of 'human capacities' for certain types of labour. Such motions may then be quantified in terms of the *time* required to produce particular commodities. But, such an 'economisation of time' does *not* necessarily constitute a minimisation of *work. Work* is what workers do, and can and do measure. *Labour* is what management can and does measure, under the rubric of 'work measurement', for the purposes of controlling work processes, according to the requirements of valorisation, through our economisation of *labour time* (This is not to say that in certain circumstances and conditions management may not seek familiarity with work purpose, meaning, significance, etc., in the interests of valorisation, through, for example,

'employee counselling', 'job enrichment schemes', and the like [16]).

Now, it is apparent that Sohn-Rethel recognises some of these considerations. For example, he states that, Taylor's "method of 'accurate and scientific study of unit times' " could be "a method operated by the workers themselves, *although it would certainly differ substantially from Taylorism*" (Sohn-Rethel, 1978, p. 170, emphasis added). But, such qualifications are subverted by the crucial identification of these 'unit times' with the economisation of time in the sense of a minimisation of effort and fatigue, rather than the requirement of a managerial intensification of labour dictated by processes of valorisation. The 'unit times' of Taylorism are *labour times* under conditions of capitalist production. As such they do not necessarily represent, nor are intended to provide for, any minimisation of effort and fatigue. Indeed, because they are derived through a fragmentation of work processes and individualisation of workers in such processes, they are as likely to involve a maximisation as a minimisation of the effort and fatigue entailed in the production of particular use values (17).

In summary, it is argued here that Sohn-Rethel's critique of scientific management fails to penetrate even scientific management's own representations. In effect, Sohn-Rethel accepts Taylor's own formulation of 'the problem' as 'economy of time', indicates how a solution to this problem was sought through time and motion study, and then argues that such an establishment of 'unit times' has a human universality transcending capitalist production. Further, what is identified as the crucial moment of scientific management is the development of " . . . . . a novel mental/manual division of labour", in which knowledge and hence control of work processes passes from the possession of workers to management. Such a position enables Sohn-Rethel to identify " . . . . . .the contrasting condition of socialised labour placed under socialism or placed under capitalism" as "defined by the difference as to whether the workers are in possession, or whether they are dispossessed of the socialisation of their labour. 'Socialism' would be constituted through the repossession by the workers of such knowledge, " . . . . .the unification of mental and manual labour", admittedly, " . . . a gradual and arduous process", and one which presupposes " . . . . .the overthrow of capitalism and a successful establishment of the dictatorship of the proletariat" (Sohn-Rethel, 1976, p. 39). But it is *arguable* that the overthrow of capitalism and the establishment of the dictatorship of the proletariat *presupposes* the displacement of managerial forms of work organisation, which embody the disunity of mental and manual labour, and in this connection Sohn-Rethel's advocacy of a "critique of scientific management as a programmatical discipline which could be carried into the details of the class struggle on the factory floor . . . . . as a weapon for countering every move of the management" (Sohn-Rethel, 1976, p. 40) is to be thoroughly welcomed. But, *in effect*, the various arguments presented by Sohn-Rethel provide certain ideological support for managerial forms of work organisation and continuing dispossession of workers. They do not provide for a materialist critique of scientific management and, thereby, contribute towards the establishment of conditions necessary for *socialist* forms of work organisation, com-

mensuration of labour and organisation of production. They do not provide for socialist strategy 'on the factory floor'. Much work, if not labour, is required in order to develop such a critique and engage effectively in such struggles.

NOTES

1 For an introduction to Sohn-Rethel's stimulating and provocative arguments see Reinfelder and Slater 1978. What is presented here is *not* intended primarily as a criticism of Sohn-Rethel, but rather as a contribution to the development of the critique of 'scientific management' in general, and 'work study' in particular, which he has so persuasively advocated. See in particular Sohn-Rethel 1976. The argument as such has undergone certain modification since discussion at the 1978 C.S.E. Conference and subsequently. Thanks to various comrades for critical comments.

2 Somewhat in contrast Tronti 1976 quotes the argument by Commons to the effect that the strategies of 'scientific management' "are doing exactly the things that force labour to become *class*-conscious. While a man retains individuality, he is more or less proof against class feeling. He is *self*-conscious . . . . . .But when his individuality is scientifically measured off in aliquot parts and each part is threatened with substitution by identical parts of other men, then his sense of superiority is gone. He and his fellow-workmen compete with each other, not as whole men but as units of output. . . . Both are ripe to recognise their solidarity, and to agree not to compete. And this is the essential thing in class conflict." (pp. 120–1, original emphasis).

3 This is not to argue for a certain 'innate human calculative capacity', but rather, 'workers playing according to the rules of the piecework game'. See Hobsbawm 1964.

4 See Watson 1935 for an account of opposition to such instruction cards at Thornycrofts earlier this century. It would seem that in at least certain circumstances such instruction cards "disappeared from the machines—no one knew where they went. They just vanished", p. 92. Also, Watson 1934, "Charts indicating the feeds and speeds to be employed were fixed to every machine", but "Passive resistance and sabotage were rife." p. 12. It would seem reasonable to suppose that the particular form in which 'Taylorism' is imposed varies according to the 'empirically given circumstances', which require analysis for the purpose of undertaking any investigation of capitalist or managerial forms of work organisation. In particular, the derivation of *managerial knowledge* of certain work processes *may* be essentially problematic. In which case, it is not apparent that the notion of a 'capitalist labour process' is particularly constructive. For example, "the capitalist labour process is that specific form of the collective worker based on machinomanufacture in which capital having a monopoly of knowledge and power over the relations between labour and the means of production, uses this power, this real domination, in order to enforce the object of valorization." Brighton Labour Process Group 1977, p. 13. Is this intended as 'the limiting case', with other 'non-capitalist labour processes' representing circumstances and conditions in which other objectives prevail? Friedman's 1977 discussion of 'worker resistance' as a determinant of forms of work organisation appears pertinent, but such 'worker resistance' also appears as posited rather than located in terms of specific characteristics of capitalist production.

5 See Currie 1977, chapters 12–22 for an elaboration of these notions, and International Labour Office 1969, Part Three. As far as the T.U.C. official guide to work study is concerned, these procedures now provide an 'objective' solution to the previous problem of the 'subjectivity' of 'rating procedures'. While work study is in progress,

"it is the job of the work study man to 'rate' the operator, as well as to time him. Whereas timing is, in effect, measurement—with a stop watch—rating is a matter of individual assessment, even when made by a well trained study man.", T.U.C. 1970, p. 9. But, now that the 'subjective problem' of 'rating'—that is, assessing how hard an individual worker is 'actually working'—has been solved, 'objectified' through the specification of rating procedures—'work' can actually be 'measured' by time. And time is what work study stop watches and 'clocking-in' mechanisms actually measure.

6 See especially Roy 1952, Roy's introduction to Matthewson 1969, and Whyte 1952, Ch. 3.

7 See *Capital* Volume One, Part 4, Ch. 15, 3 (c). It may be noted that Marx's consideration of this form of production of relative surplus value is located as follows: "The objective of the development of the productivity of labour within the context of capitalist production is the shortening of that part of the working day in which the worker must work for himself, and the lengthening, thereby, of the other part of the day, in which he is free to work for nothing but the capitalist. How far this result can also be attained without cheapening commodities will appear in the following chapters, where we examine the particular methods of producing relative surplus-value." Marx 1976 p. 438. Palloix's 1976 presentation conflates these analytical levels and thereby precludes the possibility of developing the argument presented in this paragraph for the purposes of investigating specific forms of work organisation under capitalist conditions of production. That is, addressing the important historical materialist question, "how is it that capitalist relations of production, seen as relations of formal subordination, determine the concrete forms of the capitalist organization of immediate production?" Pignon and Querzola 1976, p. 80.

8 See Marx 1976, Part Five, and Rubin 1973, espec. ch. 14, p. 156. According to Taylor, "The low cost of production which accompanies a doubling of output will enable the companies who adopt this management, particularly those who adopt it first, to compete far better than they were able to before", quoted in Currie 1977, pp. 20–1.

9 See Friedman 1977 (1) and 1977 (2) for a discussion of various managerial strategies, but also the comment in note 3 above.

10 Indeed, Baldamus 1961 argues that "The true purpose of scientific objectivity in the practice of work measurement is precisely the opposite of what it claims to be in theory: though precision and consistency in the form of technical terms and measuring appliances are indispensable, and even important, they have the function, not of eliminating the intrusion of effort conceptions, but, on the contrary, of detecting them and making them more amenable to consistent guesswork . . . . .The true purpose of time-study, in other words, is to guess as consistently as possible the purely subjective element of effort standards, and subsequently to adjust rates of pay in accordance with them. Moreover, the very act of timing a job may raise the acceptable level of effort." pp. 45–6. But, precisely *why* 'work measurement' has this particular form and function is not a question which Baldamus entertains.

11 See Currie 1977, particularly Part 2, and International Labour Office 1969, Part Three, for a specification of these concepts and procedures.

12 See Taylor 1964 *The Principles of Scientific Movement*, pp. 53–7, and somewhat more recently, Ryan 1947, "With respect to the problem of. . . . . the absolute validity of the standards in providing for a "fair day's work". . . we have concluded that there is no way of determining what is a fair rate of performance for the worker until it is possible to measure and combine all the effects of work upon the individual. Pending the discovery of a method of achieving this difficult goal, the only way of establishing absolute standards fair to the

worker seems to be to observe the level of effort which is used on average under present incentive conditions in industry. This represents the workers' estimates of a satisfactory balance between the return for their work and what the work costs them in terms of effort, fatigue, etc.", p. 63. It would seem that under capitalist conditions of production 'industrial applied psychology' faces certain very real problems, specifically capitalist problems. Baldamus 1961 considers that Ryan's statement constitutes the definitive statement that, at the present level of the development of 'industrial psychology' at least, work is 'inherently unmeasurable'.

13 See Himmelweit and Mohun 1978, particularly the Appendix where the relationship between the commensuration of socially necessary labour time and clock time is lucidly sketched. As they point out, "In the abstraction of simple commodity exchange, there is no reason why the time that a tailor takes to produce that which is exchanged with the produce of one hour's labour of a carpenter, should be one hour *measured by the clock*. As socially necessary labour times these are equivalent. But clock-time is only introduced with the wage labour relation when labour power is sold for specified amounts of time." p. 98. The specific social forms through which clock times operate in the capitalist process of social commensuration of labour require investigation. See Thompson 1967. Sohn-Rethel fails to observe Rubin's 1973 scrupulous and crucial strictures that "socially-equal labor is not only qualitatively different from physiologically-equal labor, but the quantitative determination of the first can only be understood as the result of social equalization of labor. The qualitative as well as the quantitative characteristics of social labor cannot be grasped without analysis of the social form of the process of production in which the social equalization of labor takes place." p. 155. See also Rubin 1978 where he aims to bring out more clearly "the distinction between the *social commensurability of labour* that is characteristic of any society . . . . and the specific form in which this commensuration is achieved in capitalist society, the form of *abstract labour*.", 'Introduction' p. 107. The effect of ignoring such a distinction is irredeemably reformist.

14 See Roy 1952, 1954. For Baldamus, given his preoccupation with 'the problem' that "the formal contract between employer and employee is *incomplete* in a very fundamental sense . . . . . nothing is ever said about effort or efficiency", the significance of Roy's various reports lies in the revelation of "the high degree of certainty with which different kinds of operation were compared and summarily classified as 'bad' or 'good', 'hard' or 'easy'. This does not only imply that different people must experience the various components of effort in a similar way. It also means that they share specific expectations in respect of gross earnings; for the criteria of 'good' and 'bad' refer to the varying chances of earning a given amount of money. Thus, what is standardised is in fact the *value* of effort in terms of the employee's wage expectations" pp. 92–3 (original emphasis), rather than that the workers Roy observed were engaged in a systematic and highly elaborated subversion of 'managerial prerogatives', founded on precise calculation of the necessary techniques and work content of the managerially specified range of 'work tasks'. That is, the workers Roy observed were engaged in a particular form of *work measurement*, as against, although to some extent conditioned by, managerial 'work measurement'. But such a form of work measurement does not qualify as a valid form of 'work measurement' as far as Baldamus is concerned.

15 For example, it is interesting to compare the accounts of processes of work measurement and 'work measurement' provided by Roy 1952, 1955, and Haraszti 1977.

16 See for example the discussion by Warr and Wall 1975 whose position

"is that work will always matter to people, that they will always love it and hate it, and that society, through changing the nature of some work, should help people to love it more than hate it", p. 11, all in the interests of that most important consideration "minimizing (the) time required to perform (an) operation", p. 177, no doubt.

17 See Baldamus 1961 for a discussion of certain social determinants of effort and fatigue, and the conclusion that work is inherently unmeasurable. In contrast Gorz 1976 argues "looking for maximum physical productivity is exactly the same as looking for the conditions that allow workers to produce the greatest possible quantity of a given type of product while using the optimum amount of energy in the most rational and effective manner. It is not a matter of reducing the amount of energy used to a *minimum*; a rhythm of work that is too slow or a job that is too easy or too monotonous is more exhausting than a rhythm and a degree of difficulty and complexity that keep the individual productive and intellectually alert. So the conditions for the maximum productive efficiency of labour can be worked out only collectively, by the workers themselves." p. 169 (original emphasis).

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