

THE MAKING OF A CYBERTARIAT? VIRTUAL WORK IN A REAL WORLD

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It is possible to argue that in the aftermath of 1989 a single global economy is in formation. As the WTO dismantles any remaining checks on the free movement of capital, goods, services and intellectual property between countries, transnational corporations have an open field. With the terms of employment of a growing proportion of the world's population determined either directly or indirectly by these same corporations, the conditions would seem, at last, to have arrived to render possible the fulfilment Marx's injunction at the end of the Communist Manifesto: 'Workers of the world unite'. But are there in fact any signs that a global proletariat with a common consciousness is emerging?

This essay takes as its starting point a conception of capitalism as a dynamic force whose engine proceeds by the interrelated processes of commodification and accumulation. On the one hand it seeks insatiably for new commodities from the production of which surplus value can be extracted, and on the other for new markets to fuel its voracious expansion. New commodities arise either from the drawing into the cash economy of activities which were previously carried out by unpaid labour, for gift or exchange, or by the elaboration of existing commodities. Human activities and needs thus stand at either end of the process: production and consumption. The inevitable impetus is towards a complete industrialization of the globe, with the entire population involved on the one hand in contributing towards the production or circulation of commodities and the capital accumulation process in some capacity, and on the other in an ever-greater dependence on the purchase of these commodities for their survival.

The commodification process entails continuing seismic shifts in the social division of labour. This is not the place to describe in detail how, for instance, subsistence agriculture gives way to forms of farming locked into the market by the need to acquire such things as seeds, tools and fertilizer, as well as to sell its produce, or how in the process new social categories are created, such as the landless rural wage labourer or the plantation manager. Or how the resulting changes in a rural economy force peasants to send their children to the city as factory workers. Or how the automation of factories leads to a growing complexity in the division of labour which generates new groups standing between the paradigmatic proletariat and bourgeoisie: the foreman, for example, or the skilled draughtsman, or the purchasing manager. Or how these groups in turn are threatened or reconstituted at the next twist of technological development. Here it is enough simply to point out that their rise or demise affects not only the composition of the labour force—the organization of production—but also the structure of the market—the organization of consumption—since each of these groups buys commodities as well as selling its labour.

This point becomes particularly relevant when we come to discuss the current wave of technological change—the widespread use of information and communication technologies (ICTs)—because these, unusually in the history of automation, are technologies of both production and consumption. The possession or lack of these technologies is therefore likely to create a major new fault-line running through entire populations. The ‘digital divide’ is the currently fashionable term for this fault-line.

But before examining these new demographics in detail, it is necessary to take a step back and define what work it is we are talking about, by no means an easy task.

I

Whilst thinking about this essay, I wrote in a newsletter,

Recent work has raised in a very acute form the problem of how to name the kinds of work which involve telematics. Even the traditional terms are unsatisfactory. ‘White collar’ implies a particular kind of male office worker who probably ceased being typical (if he ever was) sometime in the 1950s. ‘Non-manual’ denies the physical reality of pounding a keyboard all day. ‘Office work’ links it to a particular kind of location when the whole point of recent developments is that they mean such work can be done anywhere. And most of the newer terms are even worse. ‘Telecommuter’ applies only to those people who have substituted one kind of location (the home) for another (the city centre office). ‘Teleworker’ again tends to be restricted in practice to those workers who have relocated and cannot be applied to that whole class of workers

whose work is *potentially* delocalizable. Some commentators have come up with categories like ‘digital analyst’ or ‘knowledge worker’ but—apart from sounding rather pretentious—these tend to suggest a sub-category of work towards the top end of the skill scale. On the other hand ‘information processor’ falls into the opposite trap of suggesting that it applies only to the more routine work, like data entry. I notice that the European Commission’s ‘New Ways to Work’ unit has lately taken to talking about ‘e-work’ and ‘e-workers’. This is certainly in tune with the current fashion in New Labour Britain, where recent government statements on the ‘Information Age’ policy include reference to the appointment of an ‘e-minister’ to be in charge of ‘e-business’ and an ‘e-envoy’ to ensure that the policies are directed towards ‘e-inclusion’. Perhaps ‘e-work’ is indeed the least bad option.¹

I was interested to receive the following reply from Alice de Wolff, a researcher based in Toronto:

I was amused by your discussion about what to call ‘it’. We have had constant, very similar discussions about ‘the’ term ... Our experience is that there are two issues—one, to find an adequate description, and two, to find one that the workers involved relate to. We haven’t managed to bring them together in any satisfactory way. When we use language other than ‘office workers’, or ‘administrative professionals’ (not my favourite), or ‘administrative assistants’, the people who do the work don’t think it’s about them. I am most comfortable with ‘information workers’, because I actually think it describes much of the work very well, and suggests a central location in the ‘information economy’. I use it, and ‘front line information workers’ when I’m speaking with groups of office workers, and think it works well when used in context. But if we try to use it as a title of a document, event, etc., very few people relate’.²

This encapsulates very well the tension which underlies any discussion of class: between class as an analytical term (objective class position) and class as an aspect of personal identity (subjective class position). This in turn reflects the broader tension between structure and agency as conceptual frameworks for understanding the dynamics of social and economic change. I would not wish to minimize the difficulties of resolving these tensions in relation to other class categories, such as the ‘working class’ or the ‘peasantry’. Nevertheless, the fact that such difficulties should arise so acutely in this context (which, for lack of a better term, I will call ‘office work’ for the moment) is indicative of a particular lacuna in the history of socialist thought.

With a few notable exceptions, the literature on office work leaves a distinct impression that on the whole socialists would rather not think about the subject at all and, when they have reluctantly had to do so, have been at a loss as to how

to categorize office workers and whether to place them, with Crompton and Gallie, respectively, in a 'white-collar proletariat'³ or 'new working class'⁴; to follow Lenin or Poulantzas⁵ in locating them as part of a petty bourgeoisie whose interests lie with small employers and are opposed to those of manual workers; or to hedge their bets along with Wright, and regard them as occupying 'contradictory locations within class relations'.⁶ Marx supplies a modicum of support for each of these positions. In his account, the inevitable proletarianization of the petty bourgeoisie (craft and own-account workers and small employers) sits side by side with an equally inevitable expansion in the numbers of employed clerical workers (whom he terms 'commercial wage workers'). However, he refuses the status of proletarian to the latter, stating that 'the commercial worker produces no surplus value directly' because 'the increase of this labour is always a result, never a cause of more surplus value'. Furthermore, he is of the opinion that 'the office is always infinitesimally small compared to the industrial workshop'.⁷

This is not the place for a detailed overview of debates about class. It is worth noting, however, that some degree of muddle about where to locate office workers seems to persist whether class is defined in relation to occupation (which corresponds, as Marshall et al. have pointed out, with categories defined by the technical relations of production⁸); to the social relations of production (the ownership or non-ownership of the means of production); to the social division of labour; to comparative income, to caste-based or other culturally constructed hierarchies (Weber's 'status-groups'); or to some empirically constructed stratification lacking any coherent conceptual underpinning, as in most official statistical categorizations.

II

During the nineteenth century there were reasonable empirical grounds for regarding 'clerks' as male. In the British Census of 1851, over 99% of people listed in this category were men. Despite an accelerating entry of women into the clerical work-force from the 1870s onwards, until the 1960s most theorizing about the class position of office workers continued to be rooted in the assumption that they were masculine. The two classic studies of office workers in the post-war period, Wright Mill's 'White Collar'⁹ and Lockwood's 'the Black-Coated Worker'¹⁰ reveal this assumption only too clearly in their titles which also, in their different ways, represent a sort of verbal throwing up of the hands in defeat at the problem of how to construct a conceptually coherent definition of office work. If there is no other feature which uniquely delineates office workers from the rest of the workforce, we can feel these authors thinking, then at least they have their clothing in common.

Although one can sympathize with the label problem, such blindness is staggering. Whilst these books were being written, women (clad, no doubt, in brightly-coloured New Look shirt-waisters or pastel twin-sets) were entering

office work in unprecedented numbers, so that by the time of the 1961 census they represented about two-thirds of all clerical workers, in both Britain and the United States¹¹—a proportion which had risen to three-quarters by the 1971 census. Wright Mills does in fact devote six pages of his 378-page opus to a discussion of the ‘white-collar girl’ but characterizes her mainly in terms of her love life. A discussion of gender plays no part in the formation of his bleak conclusion (essentially derived from Lenin) that white-collar workers will never develop distinctive forms of political agency and that even if they did, ‘their advance to increased stature in American society could not result in increased freedom and rationality. For white-collar people carry less rationality than illusion and less desire for freedom than the misery of modern anxieties’.¹²

There is a blurred recognition in these authors’ work that office workers cannot be regarded as a single homogenous entity. But this is combined with a strange reluctance to anatomize the differences within the broader category which can seem on occasion like a wilful refusal to see the obvious. This obliviousness offers a clue to the more general neglect of office work in socio-economic analysis, and, more specifically, in socialist discourse. It confronts the analyst in a particularly acute form with the unresolved ‘woman question’ which has been flapping about the attic of Marxist theory since its inception.

Most theories of class, at least until the 1960s, assigned women unproblematically to the class position of their fathers or husbands. If they were not economically dependent on these men and played an independent role in the economy (something with which some theorists were already uncomfortable) then this did not pose major problems because they would normally occupy positions in the same class as these fathers or husbands: the wives and daughters of factory workers would also work in factories; the wives and daughters of rentiers would also be rentiers, and so on (Marx’s argument that domestic servants did not form part of the proletariat caused a few hiccups here, but not major ones, since servants were regarded as part of an obsolescent class and anyway merged into the reserve army of the lumpenproletariat from which there could be movement in and out of the proletariat without upsetting any important theoretical applecarts). In other words arguments could be developed on the assumption that peoples’ class positions *as citizens* (in which the basic unit is the household) were the same as their class positions *as workers* (in which the basic unit is the individual); and, indeed, that the former derived from the latter. Whilst women are regarded simply as members of households no tension between these different identities need arise and movements between classes (for instance by ‘marrying up’ or ‘marrying down’) can be dealt with under the heading ‘social mobility’.

The minute female office workers are treated *as workers*, however, this simple mode of analysis breaks down. One is forced to confront the awkward fact that office workers may occupy a different class position from their husbands or fathers. The most thorough empirical study of class position in the UK of which

I am aware concluded that ‘fully half of the conjugal units in our sample are cross-class families, using the three-category version of Goldthorpe’s class schema’.¹³ Similar disparities arise using other classification methods, such as the Registrar General’s categories used in UK official statistics, or Wright’s neo-Marxist scheme.

This has implications not only for an analysis of the work-force but also for more general social analysis: if it is taken seriously, the household can no longer be perceived as a coherent political unit but must be recognized as fissured and complex; the atom must be split.

For the new generation of political analysts who came to adulthood in the 1960s and 70s a serious examination of office work *as work* posed enormous theoretical challenges and this may be the most charitable explanation of why it was, comparatively speaking, so neglected as a subject amongst those who were attempting to retheorize class politics at the time. There is perhaps another more personal reason, rooted in the class origins of this new generation of Left intellectuals. In the UK, at least, the post-war welfare state opened up new forms of upward mobility for men and women of working-class origin. Selection at the age of eleven filtered a high-achieving minority into grammar schools from which they could enter the expanding university system. The novels and plays of the period are full of the class guilt which ensued. The act of leaving one’s father’s class was experienced acutely as an act of betrayal but this was intertwined with an intoxication at the intellectual freedom of the new life of mental work. An oedipal delight at escaping from the authority of this father was combined with a romantic sense of loss and exile from the warmth and solidarity of a working-class community which was simultaneously both safe and claustrophobic, both politically revolutionary and morally oppressive.

These were the upwardly mobile sons of the blue-collar heroes of Sennett and Cobb’s ‘Hidden Injuries of Class’,¹⁴ the ‘brainy’ (and by implication effete) students who sat indoors revising for their university entrance examinations whilst their sneering mates who had left school at fifteen flaunted their new leather jackets and motorbikes and spent their weekly wages on taking bouffant-haired girl-friends down to the Palais to rock and roll on a Friday night. They felt both superior to and excluded from this new consumerist working-class culture and this, perhaps, inspired in them a permanent desire to earn the respect of these by-now-idealized working-class men. If they thought about women office workers at all it was most usually as class accessories of the bourgeoisie. One archetype of the period is the secretary who acts as a gatekeeper for her boss. With her crisply-accented ‘I’m sorry but he’s in a meeting right now’ and her unattainable sexual attractiveness she can humiliate the working-class shop steward who is trying to gain access quite as effectively as the snootiest of head waiters. If any independent political agency is attributed to her at all it is (perhaps with some unconscious projection) as a traitor to the working class.

Only some explanation like this, it seems to me, can make sense of the subsequent political development of this generation of male left intellectuals: the

romanticization and stereotyping of specific forms of working-class life long after many of their features had already passed into history; the almost fetishistic preoccupation with certain types of male manual work (coal-miners, auto workers, truck-drivers, dockers); the anxious and competitive display of their own working-class antecedents; the insistence that feminism was middle-class and alienating to 'real' working-class men.

In most cases it was not until the dawning of the 1980s that in their political imaginations these analysts were able to accept that proletarian men were as likely to be picking up the kids from school whilst waiting for their wives to get home from the office as to be coming home grimy from the pit or factory expecting to find a meal on the table.

III

Perhaps because he had enough direct experience of manual work to have no need to prove his political virility in this respect, it was Harry Braverman who constituted the honourable exception to this pattern and undertook, in his monumental *Labour and Monopoly Capital*,¹⁵ the first serious theoretical engagement with white collar work which recognized the office as a differentiated locus of struggle between capital and labour. Braverman also demonstrated a link between technological change and change in the division of office labour. His (essentially Marxist) 'degradation' thesis was later challenged from a Weberian perspective by Goldthorpe who argued that the empirical evidence (derived from a study of census data) did not support the proletarianization hypothesis but that on the contrary what was taking place was the development of a new 'service class'.¹⁶ Perhaps more importantly than whether Braverman was 'right' in the particulars of his analysis, this debate, coinciding as it did with a tremendous flowering of thoughtful feminist speculation about the relationship between class and gender, between paid and unpaid work, the nature of 'skill' and the explanation for gender segregation in the labour market,¹⁷ opened up an immense and fertile field of enquiry.

The resulting literature covered an enormous range: agit-prop handbooks designed to rouse office workers to action, like those by Tepperman and Gregory in the United States or Craig in Britain; serious academic studies, like those by Crompton and Jones in Britain or Game and Pringle in Australia; and more journalistic overviews giving anecdotal support to the proletarianization thesis, like those by Howe, Howard, or Siegel and Markoff in the United States or Menzies in Canada.¹⁸

As well as raising a range of interesting questions, this added immeasurably to the store of empirical knowledge of the working conditions of office workers and the ways in which these were being transformed under the combined impact of the restructuring of markets, the ideological triumph of neoliberalism and the impact of technological change. Most of these studies, however, reflect the fact that they took place within specific geographical locales. The labour

markets they analyse are generally national or regional ones, and the workers' positions are mapped against those of their compatriots in other industries or occupations within these national labour markets. Although there have been a number of studies of globalization of blue-collar work, little account is taken of the implications of the relocation of non-manual work across national boundaries. A partial exception is a series of small-scale empirical studies of data entry workers in developing countries¹⁹ which implicitly follow Braverman's degradation thesis by drawing direct comparisons with the conditions of women workers in production work. What is missing is an analysis which examines the position of these office workers both in their own local labour markets and in relation to their comparators in other countries.²⁰ This is an enormous task which I do not dare to attempt here. Instead, what I will try to do in the next section of this essay is to clear away some of the underbrush which is currently impeding clarity of thought in order to specify the sorts of questions which researchers will need to address to produce the evidence which might render such an analysis possible in the future.

IV

Let us begin by outlining some of the dimensions of the problem. Office workers (to stick, for the time being, with this unsatisfactory term) can be defined in at least six different ways: in terms of the *functional relationship of their work to capital*; their *occupations* (their place in the technical division of labour); their *social relation to production* (the ownership or non-ownership of the means of production); their place in the *social division of labour* (including the gender division of labour in the household); their *comparative income* (and hence their market position as consumers); and their social '*status*'. Definitions constructed in these different ways are not necessarily coterminous and produce shifting and overlapping groups, riven with internal contradictions. And, of course, the structural categories thus created may not be recognized as relevant by the office workers themselves, who, in their upward or downward or horizontal trajectories across the boundaries between them may prefer to differentiate themselves by quite other criteria—their educational qualifications, for instance, or their consumption habits, or where they live, or, like Wright Mills and Lockwood, the clothes they wear to work.

Any analysis is further complicated by the fact that the empirical data, in the form of official statistics, are constructed using classification systems which do not map neatly on to any of these analytical categories. Nevertheless, let us recapitulate the evidence, such as it is, in relation to each of these approaches.

First, in terms of its *relation to capital*, office work can be regarded as covering the following functional categories: (a) design or elaboration of the content of products and services—including such things as software development, copy-editing, the design of Web-sites, product design, etc.; (b) purchase of inputs to these products or services and their sale—the army of clerks whose numbers,

according to Braverman, multiply exponentially as the number of transactions increases, because of the need for the value of each transaction to be recorded by a ‘mirror’ in a system which ‘assumes the possible dishonesty, disloyalty or laxity of every human agency which it employs’;²¹ (c) management of the production and distribution processes and of the workers themselves—descended from the eighteenth-century ‘time-keeper’, this class now includes a range of human resources management and supervisory functions as well as logistical tasks; (d) circulation—much of the banking and financial services sector falls into this category, as do some accounting and retail functions; (e) reproduction of the work-force—activities associated with teaching, child care, health care, social work, etc; (f) local, national or international government functions connected with the provision of infrastructure, market management and policing the population.

Of these categories, only (c) and (d) correspond to Marx’s ‘commercial workers’ of whom he maintained that ‘the commercial worker produces no surplus value directly ... the increase of this labour is always a result, never a cause of more surplus value’.²² Category (a) makes an input to the product in the form of knowledge in much the same way that a craft worker contributed skill in the past. Its existence as a separate non-manual task is thus merely a reflection of an increase in the division of labour. Workers in this category, it can be argued, contribute directly to the creation of surplus value in so far as the product of their labour is appropriated from them by the employer.

Such a typology could have been sketched out at any time in the last two hundred years. However, applying it in any specific case has been rendered immeasurably more complicated as the years have gone by and the division of labour has grown more complex.

Perhaps the most important change which has taken place is the increasing commodification of ‘service’ activities. In the comparatively simple markets which Marx and Engels observed it was feasible to regard the archetypal capitalist commodity as a physical object made in a factory designed either to be sold to another capitalist as a means to produce other physical objects (for instance a loom, a vat or a printing press) or to be sold to a wholesaler or retailer for final consumption by the consumer (for instance a shirt, a bar of soap, or a newspaper). Since then, enormous elaborations have taken place. Each of the types of activity outlined above has itself become the basis of a host of new commodities, ranging from software packages to mind-controlling drugs, from electronic surveillance systems to credit cards, from educational CD-ROMs to baby alarms. Although the principles of economic analysis remain essentially the same,²³ breaking their production down into their component parts and plotting their interactions with each other and with the fulfilment of the primary functions outlined above is an intricate and time-consuming business. Indeed, in some cases the process can appear like zooming in on fractals, a descent into ever-smaller wheels within wheels, as with the seemingly inexhaustible inventiveness of capital each area of human activity becomes the basis for profitable new commodities.²⁴ Within the

production process of each commodity, even if it is carried out within the a parent organization as a sort of sub-loop in the production process of another, the whole range of activities (design; management; execution; delivery to the customer), is reproduced in miniature. And the task of assigning workers according to their functional relation to capital is rendered even more difficult by the increasingly complex division of labour within functions.

Analysis is complicated still further by changes which have taken place in the ownership structure of corporations. The combined effects of privatization, the disaggregation of large organizations into their component parts, convergence between sectors, cross-ownership and 'vertical integration' have made a nonsense of the tidy traditional divisions between 'primary', 'secondary' and 'tertiary' sectors and between the 'public' and 'private' sectors of the economy as well as between the sub-sectoral categories within these devised by government statisticians. The new 'multimedia' sector, for instance, brings together organizations traditionally classified in many different places, including the public sector (state broadcasting corporations); metal-based manufacturing (computer companies, via their software divisions, and electronics manufacturers); printing and paper manufacturers (publishers); record and tape manufacturers; toy manufacturers (the ancestors of some computer game companies); business and financial services (independent software companies which are not branches of computer manufacturers); film distributors; and telecommunications companies. Convergence is taking place in many other areas of the economy too, for instance between banking and retailing and (thanks to biotechnology) between pharmaceuticals and agriculture.

Not only are the old sectors dissolving and new ones forming; there are also complex interrelationships between the corporate actors involved. Some have entered into shifting alliances to carve up particular markets or to collaborate in the development of new products;²⁵ others have bought stakes in each other (i.e., in firms which the public imagine to be their competitors), and mergers, de-mergers and take-overs are announced continuously. To make matters even more complicated, in addition to these external realignments, most companies are also involved in a continuous process of internal reorganization, whereby individual functions are transformed into separate cost or profit centres, or floated off as separate companies. Add to this the impact of outsourcing to external companies and we arrive at a situation where corporations can no longer be regarded as stable and homogenous. Rather they must be seen as mutually interpenetrating entities in constant flux, held together by an elaborate web of contracts which are in a continuous process of renegotiation. The sectoral classification of the 'employer' to which any given worker is assigned is an almost-accidental by-product of all these shenanigans, and this makes it impossible to use official statistics, at least in their present form, as a basis for serious analysis.

A second method of defining office workers is in relation to their *occupations*—the tasks that they carry out—or their labour process. Where workers

have been able to organize effectively in the past and set up professional associations or trade unions, and especially where negotiation has succeeded in making recognized qualifications a basis for limiting entry to particular trades or professions, these occupations can be said to be largely socially defined, their boundaries made explicit in these negotiations and their practices defined by custom and by the vigilance of the actors who stand to gain from the continuation of these forms of closure (to use Parkin's Weberian term).²⁶ In most cases, however, the tasks carried out by any given group of workers are determined in large part by the technical division of labour and their labour processes are thus shaped by the design of the prevailing technology (which, it must be added, is itself shaped by the assumptions of those who commission it, and in which the existing social relations of production are therefore already embedded).

Even in the occupational groups which have defended their inherited working practices most strongly against the assaults of the last quarter-century it has been impossible to resist entirely the impact of information and communications technologies. Even doctors and lawyers, these days, not to mention telephone engineers, generally check their own e-mail from time to time, and the expectation of a personal secretary has all but disappeared amongst executives under the age of about forty-five, except for those who are very senior indeed. Meanwhile, across the rest of the work-force, an extraordinary and unprecedented convergence has been taking place. From tele-sales staff to typesetters, from indexers to insurance underwriters, from librarians to ledger clerks, from planning inspectors to pattern-cutters, a large and increasing proportion of daily work-time is spent identically: sitting with one hand poised over a keyboard and the other dancing back and forth from keys to mouse. Facing these workers on the screen, framed in pseudo bas-relief, are ugly grey squares labelled, in whatever the local language, 'file', 'edit', 'view', 'tools', 'format', 'window' or 'help', the ghastly spoor of some aesthetically-challenged Microsoft employee of the late 1980s. Gone are the Linotype machine, the rolodex, the card-index, the sheaves of squared paper, the mimeograph, the drawing board, the cutting-table, the telex machine, and all the other myriad tools of the mid-twentieth century, the mastery of which entitled one to a specific designation—the proud ownership of a unique skill. Gone too is the shared identity with other holders of that same skill. It must be remembered, of course, that the security bestowed by possessing these skills was often the security of the strait-jacket. Limited transferability meant increasing vulnerability with each wave of technological innovation, but specialist skill ownership did offer a basis for organizing and playing some part in negotiating the terms on which the newer technology would be introduced.

The skills required to operate a computer and its various communications accessories should not, of course, be mistaken for the totality of the requirements of any given job. They are often ancillary to other 'core' skills—the skills required to do 'the job itself'. However, these too may be undergoing a process

of modification (which could take the form of routinization, or full commodification) which is changing their nature. Social workers, for instance, may find themselves filling out standard forms on-screen instead of writing, or delivering in person, more nuanced and qualitative professional reports on their clients; teachers may find themselves administering standard tests; insurance loss adjusters may have lost the discretion to decide what compensation a claimant should receive; Internet journalists may be required to write to tightly defined standard formats; whilst architects may be reduced to recombining standard components instead of designing freely 'from scratch'. Often these transformations are disguised by a change in the division of labour. The job description of a professional may be stripped down to its core and the numbers of such staff reduced, whilst the former components of the job which are capable of routinization are transferred to lower-skilled workers. Thus, for instance, routine enquiries to a computer help-desk may be dealt with by the use of automated e-mail responses or by more junior staff, with only the really difficult problems routed through to the more highly-paid 'expert'. Or sick people may be encouraged to call a call centre staffed by nurses before making an appointment to see a doctor, as in the UK's *NHS Direct*.

In general, it can be asserted that the number of tasks involving standard generic computer-related skills is growing rapidly, whether this is measured in terms of the numbers of people whose jobs involve these skills exclusively or in terms of the proportion of the time spent on these tasks by workers whose jobs also require other skills (or, indeed, both). This has curious and contradictory consequences. The fact that the skills are now generic has made it easier to skip laterally from job to job, company to company and industry to industry. But by the same token each worker has also become more easily dispensable, more easily replaceable; the new opportunities thus also constitute new threats. The combination of this new occupational mobility with the huge expansion of the potential labour pool has also made it much more difficult to build stable group identities based on shared skills. Attempts to construct barriers around skill groups are thwarted by the speed of change. Any investment of time and effort in learning a new software package may be wiped out in a matter of months by the launch of a replacement. Existing hierarchies are challenged at precisely the moment that new fault-lines are created. At the head office, e-mail brings senior and junior members of staff into direct communication with each other, cutting out middle layers of management, and a strange new camaraderie develops between colleagues of different grades as one shows the other how to eliminate a virus or unzip an obstinate attachment. But simultaneously an unbridgeable gulf may have opened up between these same head office staff and their fellow-employees at a remote call centre, or data processing site.

When the only thing which can be predicted with certainty is that there will be more change it is difficult to generalize broadly about occupational trends: whilst some processes are Taylorized and deskilled, others become more

complex and multi-skilled; whilst some groups are excluded, others find new opportunities opening up. An interesting empirical study recently completed in Canada by Lavoie and Therrien explored the relationship between computerization and employment structure. Following Wolff and Baumol²⁷ these researchers divided occupations into five categories: ‘knowledge workers’, ‘management workers’, ‘data workers’, ‘service workers’ and ‘goods workers’, and concluded that the category in which there was the greatest growth associated with computerization was not, as popular mythology would have it, the ‘knowledge workers’ but the ‘data workers’—those who ‘manipulate and use the information developed by the knowledge workers’.²⁸ This provides some support for the argument that the trend towards routinization outweighs, in numerical terms, the tendency for work to become more creative, tacit and multi-skilled.

The official statistics contain no categories labelled ‘web-site designer’ or ‘call-centre operator’ or any of the other new occupational categories which are emerging, although these figure in job advertisements and are clearly operational in the labour market. The question is, how permanent are they likely to be? And will they form the basis of new collective identities? Or will workers choose to group themselves in relation to some other variable, such as the employer they work for, or the site where they are based? The answer to this question will be a crucial determinant of the extent to which new class identities will develop independently of geography, and of the potential for organizing at a transnational level.

A third approach to characterizing office workers involves analysing their *relationship to the means of production*. Put crudely, in the classic Marxist formulation, if workers own the means of production, they are part of the bourgeoisie; if they are waged workers working for an employer who owns the means of production (and thereby produce surplus value), then they can be assigned to the proletariat. Self-employed workers and proprietors of small firms, in this model, belong to a petty bourgeoisie which will in due course be steadily squeezed out in the primary struggle between capital and labour, its members pauperized or proletarianized, except for a lucky few who become capitalists.

But this model too is becoming increasingly difficult to apply to office workers. First, the tendency of self-employment to die out has obstinately refused to take place. Although it has not expanded at the rate hoped for it by neoliberals during the 1980s, self-employment remains fairly constant, at least in most developed countries. Across the EU, for instance, the self-employed constituted a hardly varying 15% of the work-force over the two decades from 1975 to 1996.²⁹ This catch-all statistical category of course includes a range of different class positions. At one extreme are the self-employed with a few employees who can perhaps be regarded as petty bourgeois in the classic sense; then there are genuine freelancers, who work for a range of different employers; and at the other extreme are casual workers whose self-employed status is a

reflection of labour market weakness—people who lack the negotiating muscle to insist on a proper employment contract even though they are effectively working for a single employer. Despite the lack of change in their overall numbers, the evidence from the UK suggests that the composition of this group is changing, in the direction of the casual end of the spectrum. A study by Campbell and Daley found that the proportion of self-employed people with employees fell from 39% to 31% between 1981 and 1991,³⁰ whilst Meager and Moralee found that new entrants to self-employment were more likely than their earlier counterparts to be young, female, and entering relatively low value-added service activities. After analysing data from the British Household Panel Survey they concluded that the chances of a self-employed person being in the lowest earning category (the lowest 10%) were three times those of an employee. Even when an allowance was made for the under-reporting of income by the self-employed, the chances were still twice as high.³¹

Self-employment is not necessarily a permanent state, however. Another study by Meager and Moralee, based on a longitudinal analysis of European Labour Force Survey data, uncovered high rates of inflow and outflow.³² This makes it difficult to regard self-employment as a stable marker of class identity; for some it might merely be a staging post between different jobs.

Another factor which makes it difficult to regard the self-employed as a separate category is the increasing tendency to manage employees 'as if' they are self-employed or, to use Rajan's phrase, to insist on 'mindset flexibility'.³³ Practices such as management by results, performance-related pay, and contracts in which working hours are not specified, combine with intensified pressures of work and fear of redundancy to produce a situation in which the coercive power of the manager is internalized. The pace of work is therefore driven by a self-generated compulsive drive rather than the explicit external authority of the boss. Closer to the piece-rates of the putting-out systems than the time-based pay (albeit with machine-paced work) of the factory, this method of management muddles the relationship between worker and employer, a muddle which is intensified when there is also a physical separation between them. One worker in seventeen in the British work-force, and a slightly higher proportion in North America, Scandinavia and the Netherlands (though less in the rest of Europe) now works from home at least one day a week using a computer with a telecommunications link to deliver work.³⁴ Of these, nearly half are formally self-employed. Since most of these workers own their own computers, it might be tempting to regard them as twenty-first-century equivalent of home-based hand-loom weavers, but can stand-alone personal computers really be regarded as the means of production? A loom can be used to produce cloth quite independently of any other loom, whereas in most cases the value of the computer to the employer rests on its being linked to others, in a system which is not owned by the worker.

This is a moot point, which there is no space to investigate further here. It relates interestingly, however, to another question which has some pertinence.

At least in a highly commodified economy, it is arguable that in order to make sense of the individuals' general relation to capital (and hence their class position) it is necessary to consider not only their relation to the means of production but also to the 'means of consumption' or 'means of reproduction'.³⁵

The inexorable process of commodification has resulted in the decline of consumer service industries and their replacement by capital goods. In order to service themselves and their families, get themselves to work and otherwise function it is increasingly necessary for workers to invest in such capital goods, from cars to washing machines. In addition, the only way to achieve a decent standard of housing is to purchase their own homes. The need to pay for all these goods locks workers ever more tightly into the market. As Andrew Carnegie was shrewd enough to notice over a century ago, a working class which owns its own housing is the best possible protection against strikes and uprisings.³⁶ It is then at least arguable that the degree to which they have succeeded in purchasing these things might affect workers' subjective view of their own class position. Whether it could be said to constitute an objective difference is a matter for investigation. There may be an analogy between workers' relationship to the 'means of reproduction' and their relationship with the 'means of production' according to which the home-owner occupies a position analogous to that of the independent craft worker, or the proprietor of a one-man business. This analogy can be taken further: the division of labour in 'reproduction work' does not necessarily just involve householders themselves. Some workers may also employ cleaners, child-care workers or other servants,³⁷ thus occupying a place in the division of labour in reproduction work which is the equivalent of that of a small employer in production. This issue is especially important in considering the class position of the 'new' information workers in developing or newly developed countries, where the employment of servants, including live-in servants, is more common. In Hong Kong, for instance, Greenfield reports that it is usual for skilled manual workers, such as engineers, and lower-paid office workers, such as call-centre workers, direct sales persons, or mobile and paging company workers, living in low-rent accommodation, to employ a live-in domestic 'helper'. 'Working families whose incomes simply cannot accommodate a domestic helper still hire them, then exert extreme pressure on their helpers to minimize costs so that they can "get their money's worth." There is even a growing tendency to hire "cheaper" Indonesian domestic helpers than Filipinas who number 350,000. It is interesting to note that in the aftermath of the Asian financial crisis the Hong Kong government intervened to alleviate the hardship of the average Hong Kong family by freezing the wages of domestic helpers!'.³⁸

The use of non-occupational variables to assign workers to a class position is, to the best of my knowledge, untested and requires further analysis. It is particularly interesting in the context of the growth in homeworking, however, since the homeworker pays for many of the things more usually provided by the employer: the work space, storage space, heating, lighting, insurance,

setting-up and putting-away time, management and monitoring (in the form of self-management, filling in reports and timesheets, etc.) as well as incurring various risks to health and security. The home computer plays an interesting and ambiguous role in this, since it is an instrument both of production and of reproduction, as likely to be used for ordering the groceries or doing the kids' homework as for the work itself.

Information and communications technologies play a pivotal role in blurring the boundaries between work and consumption, constituting as they do a shifting interface between server and served. An order for an airline ticket, for instance, may be transmitted over the telephone and keyed in by a call-centre worker or entered directly on to the airline's web-site by the customer; the labour of data entry may be either paid or unpaid. It is therefore difficult to separate a discussion of the division of labour in paid 'production' work from a more general discussion of the division of labour in unpaid, 'consumption' work, which, highly gendered as it is, brings one to the more general discussion of the *social division of labour*, the fourth category in our list, but one which is beyond the scope of this essay to address in detail.

Our fifth category is the simple empirical one of *relative income*. For those wishing to model society as a tidy hierarchical pyramid this has posed problems for over a century. The poor but genteel clerk who earns less than the vulgar navy features in many nineteenth-century novels, from Dickens to Gissing, and survives well into the twentieth century, for instance in Forster's *Howards End*, Grossmith's *Diary of a Nobody* and some of Orwell's gloomier grubby-net-curtained novels. This clerk is presented as having traded money for a foothold (albeit precarious) in the middle classes and forms a male counterpart to the impoverished but well-educated governess hovering uneasily in an ambiguous social space between the servants' quarters and the drawing room (although his origins are likely to be humbler than hers, and his accent more suburban, his gender depriving him of the ever-latent potential for class elevation or downfall which constitutes the inherent inner drama of the feminine state).

The separation of status from income underlies most systems of class ranking, even the most empiricist and least theoretically grounded. It is explicit, for instance in the rationale for the Registrar General's Categories which are used for class analysis in the British official statistics. A paper written in 1928 by a senior official at the General Register Office argued against classification by income, asserting that 'any scheme of social classification should take account of culture ... (which) the occupational basis of grading has a wholesome tendency to emphasize'. In his opinion the criterion should be 'the general standing within the community of the occupations concerned'.³⁹

Crompton and Jones note that there was parity between the earnings of male clerks and skilled manual workers from 1918 to 1936. For the next four decades, clerical workers' earnings declined in relative terms so that by 1978 they earned less than the average for all manual workers, with even the average

wage for semi-skilled male manual workers exceeding that for male clerical workers. The earnings of female clerical workers were even lower, of course: rising from 42% of men's in 1913 to 57% in the mid-50s and 74% by the end of the 70s.⁴⁰ By the end of the 1990s, the hourly earnings of women clerical workers had reached 80% of men's across the EU.⁴¹ Clerical workers clearly fall below most manual workers in terms of their purchasing power.

Now that much information-processing work can be moved from region to region and country to country using electronic links, it becomes necessary to compare earnings between countries as well as within them. Such comparisons are difficult to make with precision because of variations in the structure of taxation and benefit systems, but in the form of 'total labour costs' they figure prominently in the calculations made by employers when deciding what functions to locate where. And there are of course major differences. According to UNCTAD figures, in 1994 the average annual salary of a software programmer in India was US \$3,975, compared with \$14,000 in Malaysia, \$34,615 in Hong Kong, \$31,247 in the UK, \$45,552 in France, \$46,600 in the USA and \$54,075 in Germany.⁴² It is important, however, to be aware that such differences may be transient. The very success of the software industry in Bangalore, for instance, has resulted in a rapid inflation of local salaries which are now considerably higher than in other parts of India, such as Calcutta, where the supply of such skills still greatly exceeds demand, and in other parts of the world, for instance Russia, where routine programming activities, such as coding, are now subcontracted from India. Khilnani describes the impact on the local labour of the large-scale influx of foreign multinationals into Bangalore: 'These companies have transformed the wage structure of the Indian professional world. They are able to offer Indians in their late twenties salaries not even reached at the retirement points of Indian public enterprise salary scales'.⁴³

It is possible that such developments may signal the beginning of a global convergence in wages for workers with such specific and definable IT skills in activities which are capable of being carried out independently of location. Such a convergence, if it were taking place (and so far too little empirical research has been carried out to substantiate this), would imply a substantial gain for workers in developing countries combined with a reining in of real wage increases (if not an actual decline) in developed countries. That such increases would trickle down into the rest of the local economy in the developing countries cannot, however, be taken for granted. New forms of polarization might well develop between the holders of delocalizable jobs and workers whose jobs are geographically fixed. The extent to which the delocalizable jobs will take root in any given geographical spot is also dependent on a number of variables. If they take the form of labour-only subcontracting, then their anchoredness is highly contingent. There is always a choice open to the ultimate employer whether to send the jobs to the people or bring the people to the jobs, in the process which is known in the software industry as 'body shopping'. For at least two decades it has been a common practice for planeloads of software engineers

to be flown on demand from India to London, Frankfurt, Los Angeles or other sites where their skills are needed. Typically, in the 1980s and early 1990s they were employed by subcontractors. In 1992, liberalization of trade made it possible for the first time for software to be exported from sites in India, and a large-scale software export industry grew up based in Bangalore, and later in other centres such as Hyderabad, Poona and Chennai. However, employers still retain a choice, and both the United States and most European countries have recently loosened their immigration procedures to make it easy to get green cards for software engineers with scarce skills. Where there is a global market for skills, the employer's choice whether or not to relocate is therefore mirrored by the worker's decision whether to migrate or stay put.

Not all the new delocalized work involves technical software skills. In many developing countries there has also been a major growth in lower-skilled clerical work, such as data entry and typing, and in call-centre work. Here the earnings may well compare unfavourably with those of well-organized production workers. Gothoskhar describes how 'in the Indian context, the pay-levels of the younger call-centre workers may be much lower than those of middle-aged blue-collar workers'. However, she goes on to point out that a comparison based only on income may be misleading in terms of defining their class position: 'the very criteria of recruitment of these workers as of today are such that they are from two-income families, mostly from "white-collar" parents, people with an education in English and so on. This today at least excludes people from lower castes, people from the rural areas, and people whose parents are from what may be called the "traditional working-class" families'.⁴⁴

This brings us to the sixth category, a class definition based on a notion of *status*. This term, in its Weberian sense, can be extended to cover a range of different variables including ethnicity, language-group, religion, skin-colour, caste or even the condition of slavery. The structure of most labour markets (and the history of most labour movements) bears powerful testimony to the force of such differences in creating patterns of inclusion and exclusion, privilege and deprivation. Labour markets are segmented along racial lines in North America, Europe, Australia and Japan quite as much as (if sometimes more covertly than) as they are in many developing countries. However, the fault-lines may fall somewhat differently. One important factor is language. Entry to the new world of information work is crucially dependent on the ability to understand, speak and write English, or, in some parts of the world, French, Spanish, German, Japanese or Arabic. In countries where this is not the native language, this is likely to be the prerogative of the highly-educated. Immediately, the threshold is raised above that required in the imperial parent economy. Relative wage levels and differences in the supply of and demand for labour and also play their part, of course. It is therefore not unusual to find the sorts of work which are carried out by school-leavers, or graduates from junior college, in the USA being carried out by graduates or post-graduates in a devel-

oping country. Sinclair Jones studied a medical transcription centre in Bangalore carrying out work for doctors in the United States. She reports that in the US the work was done by homeworkers, paid a piece-rate for the number of lines typed, who would normally be educated only to community college level, but that applicants in India generally arrive with a Master's Degree. Nevertheless, 'Even though there is a rather paradoxical disparity between the qualifications base of the US and Indian workers there are still huge cost advantages to undertaking this work in India. For graduates in India with, for example, a Master of Arts, there are limited options for employment. As an English teacher in Bangalore they might earn around Rupees 3,000 per month (approx. US \$75)'. However, in the transcription centre, 'a good transcriptionist with two years' experience earns between Rupees 7,500 and 9,500 per month (US \$190–\$240) whilst some are earning over Rupees 12,000 (US \$300) per month. This compares with workers in the US who earn between \$1,800 and \$2,400 a month. The experienced Indian medical transcriptionist is then about eight times cheaper than a US counterpart'.⁴⁵ Her social status in the local economy will nevertheless be quite different.

This has implications for how office workers identify their own interests and their potential for making common cause with other workers doing identical work in other countries. This question is complicated by another issue. Where workers are employed by foreign companies, the exploitation of labour by capital may not be regarded as such but rather as an imperial exploitation of natives by colonialists.⁴⁶ Instead of perceiving their interests as being aligned with those of other workers employed by the same multinational companies, they may see their interests as national ones, best served by aligning themselves with local capitalists against the imperializing outsiders. Such attitudes are likely to be reinforced by encounters with racist attitudes amongst the workers of the developed world.

We must conclude that although there is considerable potential for the emergence of a common class consciousness amongst information-processing workers, based in a common labour process, common employers and a common relation to capital, powerful counter-forces are present which seem likely to inhibit this development, the greatest of which, perhaps, is racism.

There is considerable evidence of successful organizing by the new 'e-workers' within countries, as indicated by the 1999 strike by call-centre workers at British Telecom in the UK and unionization amongst data entry workers in the Caribbean⁴⁷ and in Brazil.⁴⁸ There is also some evidence that when selecting locations employers consciously avoid areas where workers are likely to organize. In her study of the medical transcription centre in Bangalore, Sinclair Jones reports that 'the informant did comment that in the early stages they had considered establishment in Kerala on the basis that it has extremely high literacy levels. However, Kerala also has high levels of industrial organization and the company decided not to take the risk. This kind of service provision is extremely vulnerable to stoppages given the commitment to rapid

turnaround and the company management actively seeks to avoid becoming exposed to attempts at organizing labour'.⁴⁹

However, examples of such organization across national boundaries are few and far between. One notable exception is the agreement covering call-centre workers jointly signed with Air Canada by the Canadian Auto Workers Union and their sister unions in the UK and the USA. In general, though, the evidence of resistance by these workers comes in more sporadic and anarchic forms, such as the writing of viruses or other forms of sabotage.

One factor which will undoubtedly influence the propensity of workers to organize and take militant action will be the extent to which this is likely to be in their own economic best interests. If low-level office work is perceived as the bottom rung of a ladder which can be scaled successfully by keeping on the right side of the boss, then hard work, keeping one's nose clean and sycophancy will offer the best route to advancement. If on the other hand no promotion prospects seem likely, for instance because the higher levels are located on another site halfway across the globe, or because only men, or only white people, or only people of a certain nationality or caste ever get promoted, then the best way to better one's income may well seem to lie in making common cause with one's fellow workers. Once again, we find that gender and race play a crucial role in determining class identity.

It is apparent that a new cybertariat is in the making. Whether it will perceive itself as such is another matter.

NOTES

1. *Analytica*, e-mail newsletter, March 2000.
2. E-mail from Alice de Wolff, April 2000.
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4. Duncan Gallie, *In Search of the New Working Class: Automation and Social Integration Within the Capitalist Enterprise* (Cambridge University Press, Cambridge, 1978).
5. Nicos Poulantzas, *Classes in Contemporary Capitalism* (New Left Books, London, 1975).
6. Erik Olin Wright, 'The Class Structure of Advanced Capitalist Societies' in his *Class, Crisis and the State* (Verso, London, 1979).
7. Karl Marx, *Capital*, Volume 3, (Lawrence and Wishart, London, 1974) pp. 299–300, quoted in Crompton and Jones, *White-Collar Proletariat*, p. 8.
8. Gordon Marshall, Howard Newby, David Rose and Carolyn Vogler, *Social Class in Modern Britain* (Hutchinson, London, 1988) p. 23.
9. C. Wright Mills, *White Collar: The American Middle Classes* (Oxford University Press, New York, 1951).
10. David Lockwood, *The Black-Coated Worker* (George Allen and Unwin, London, 1958).
11. Quoted in Harry Braverman, *Labour and Monopoly Capital: The Degradation of Work in the Twentieth Century* (Monthly Review Press, New York, 1974) p. 296.
12. Wright Mills, *White Collar*, pp. 352–353.

13. Marshall et al., Howard Newby, David Rose and Carolyn Vogler, *Social Class in Modern Britain* (Hutchinson, London, 1988) p. 68.
14. Richard Sennett and Jonathan Cobb, *The Hidden Injuries of Class* (W. W. Norton and Co., New York, 1972).
15. Harry Braverman, *Labour and Monopoly Capital*. (See note 11.)
16. John H. Goldthorpe, *Social Mobility and Class Structure in Modern Britain*, (Clarendon Press, Oxford, 1980) and 'On the Service Class: Its Formation and Future' in Giddens and Mackenzie (eds.), *Social Class and the Division of Labour* (Cambridge University Press, Cambridge, 1982).
17. I have discussed some of these ideas at greater length in Ursula Huws, 'Reflections on Twenty Years Research on Women and Technology', in Swasti Mitter and Sheila Rowbotham (eds.), *Women Encounter Technology* (UN University Institute of Technology, Maastricht, and Routledge, London, 1995).
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19. These are discussed in Ursula Huws, Nick Jagger and Siobhan O'Regan, *Teleworking and Globalization* (Institute for Employment Studies, Brighton, 1999) and include Annie Posthuma, *The Internationalization of Clerical Work: a study of offshore office services in the Caribbean* (SPRU Occasional Paper No. 24, University of Sussex, Brighton, 1987); Antonio Soares, 'The Hard Life of the Unskilled Workers in New Technologies: Data Entry Clerks in Brazil' in H. J. Bullinger (ed.), *Human Aspects in Computing* (Elsevier Science Publishers, Amsterdam, 1991) and 'Telework and Communication in Data Processing Centres in Brazil' in U. E. Gattiker (ed.), *Technology-Mediated Communication*, (Walter de Gruyter, Berlin and New York, 1992); D. Pantin, *Export Based Information Processing in the Caribbean, with Particular Respect to Offshore Data Processing* (FIET, Geneva, 1995); Ruth Pearson, 'Gender and New Technology in the Caribbean: new work for women?', in J. Momsen (ed.), *Gender Analysis in Development* (Discussion Paper No. 5, University of East Anglia, Norwich, 1991); and Ruth Pearson and Swasti Mitter, 'Employment and Working Conditions of Low-skilled Information Processing Workers in Less Developed Countries' in *International Labour Review* (Geneva, April, 1993).
20. Exceptions to this are Christopher May's analysis in *The Rise of Web-Back Labour: Global Information Society and the International Division of Labour*, (Plymouth International Studies Centre, University of Plymouth, 1999) and the pioneering field studies of Jan Sinclair Jones, in various unpublished papers and in 'First you see it, Now you don't: Home based telework in the global context', Working Paper presented to the Australian Sociology Association Conference, Monash

- University, Melbourne, 5–7 December 1999.
21. *Labour and Monopoly Capital*, p. 303.
 22. Karl Marx, *Capital*, Volume 3, (Lawrence and Wishart, London, 1974) pp. 299–300, quoted in Crompton and Jones, *White-Collar Proletariat*, p. 9.
 23. See my ‘Material World: the Myth of the Weightless Economy’, *Socialist Register*, 1999.
 24. I have written about this process at greater length elsewhere. See, for instance, my ‘Challenging Commoditization: producing usefulness outside the factory’, in Collective Design (eds.), *Very Nice Work if you Can Get it: the Socially Useful Production Debate* (Spokesman Books, Nottingham, 1985) pp. 149–167.
 25. Strategic alliances are discussed, *inter alia*, by John H. Dunning in *The Globalization of Business* (Routledge, London, 1993).
 26. Frank Parkin, *Marxism and Class Theory* (Tavistock, London, 1979).
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 28. Marie Lavoie and Pierre Therrien, *Employment Effects of Computerization* (Human Resources Development Canada Applied Research Branch, Ottawa, 1999).
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 32. Ibid.
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 35. UK Labour Force Survey 2000, Office of National Statistics, UK, Analysis by Ursula Huws and Peter Bates, Institute for Employment Studies, July, 2000.
 36. Quoted in Barbara Ehrenreich and Deirdre English, *For Her Own Good* (Pluto Press, London, 1979).
 37. See Brigitte Young’s essay in this volume.
 38. E-mail from Gerard Greenfield, *Globalization Monitor*, Hong Kong, June 2000.
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 44. E-mail from Sujata Gothoskar, June 2000.
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global context', Working Paper presented to the Australian Sociology Association Conference, Monash University, Melbourne, 5–7 December 1999.

46. This point is made by Peter Lloyd in *A Third World Proletariat* (George Allen and Unwin, London, 1982).
47. Pearson, 'Gender and New Technology in the Caribbean' (see note 19).
48. Soares, 'The Hard Life of the Unskilled Workers in New Technologies: Data Entry Clerks in Brazil' (see note 19).
49. Jan Sinclair Jones, 'First you see it, Now you don't: Home based telework in the global context' (see note 20).