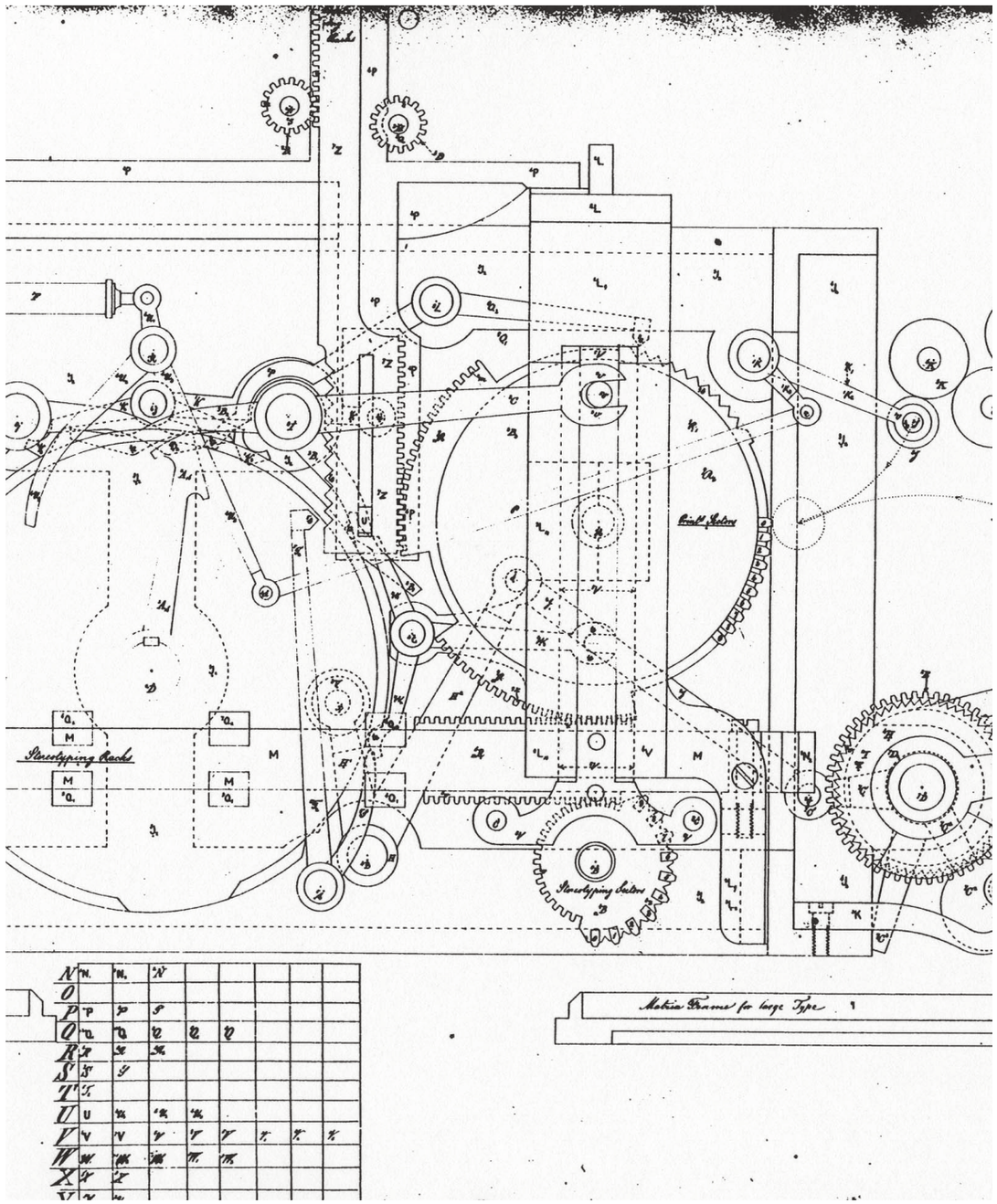
Automation and the working class



PORTION OF BABBAGE'S DIFFERENCE ENGINE.

"The great foundation-stone of wealth"

"While... individual labour as such has ceased altogether to appear as productive, is productive, rather, only in these common labours which subordinate the forces of nature to themselves, and while this elevation of direct labour into social labour appears as a reduction of individual labour to the level of helplessness in face of the communality [Gemeinsamkeit] represented by and concentrated in capital... Thus all powers of labour are transposed into powers of capital...

"Through this process, the amount of labour necessary for the production of a given object is indeed reduced to a minimum, but only in order to realise a maximum of labour in the maximum number of such objects. The first aspect is important, because capital here — quite unintentionally — reduces human labour, expenditure of energy, to a minimum. This will redound to the benefit of emancipated labour, and is the condition of its emancipation...

"To the degree that large industry develops, the creation of real wealth comes to depend less on labour time and on the amount of labour employed than on the power of the agencies set in motion during labour time, whose 'powerful effectiveness' is itself in turn out of all proportion to the direct labour time spent on their production, but depends rather on the general state of science and on the progress of technology, or the application of this science to production... "Real wealth manifests itself, rather — and large industry reveals this — in the monstrous disproportion between the labour time applied, and its product, as well as in the qualitative imbalance between labour, reduced to a pure abstraction, and the power of the production process it superintends. Labour no longer appears so much to be included within the production process; rather, the human being comes to relate more as watchman and regulator to the production process itself... He steps to the side of the production process instead of being its chief actor. "In this transformation, it is neither the direct human labour he himself performs, nor the time during which he works, but rather the appropriation of his own general productive power, his understanding of nature and his mastery over it by virtue of his presence as a social body — it is, in a word, the development of the social individual which appears as the great foundation-stone of production and of wealth. "The theft of alien labour time, on which the present wealth is based, appears a miserable foundation in face of this new one, created by large-scale industry itself.

"As soon as labour in the direct form has ceased to be the great well-spring of wealth, labour time ceases and must cease to be its measure, and hence exchange value [must cease to be the measure] of use value. The surplus labour of the mass has ceased to be the condition for the development of general wealth, just as the non-labour of the few, for the development of the general powers of the human head. With that, production based on exchange value breaks down... The free development of individualities, and hence not the reduction of necessary labour time so as to posit surplus labour, but rather the general reduction of the necessary labour of society to a minimum, which then corresponds to the artistic, scientific etc. development of the individuals in the time set free, and with the means created, for all of them... "Forces of production and social relations — two different sides of the development of the social individual — appear to capital as mere means, and are merely means for it to produce on its limited foundation. In fact, however, they are the material conditions to blow this foundation sky-high...

"The development of fixed capital indicates to what degree general social knowledge has become a direct force of production, and to what degree, hence, the conditions of the process of social life itself have come under the control of the general intellect and been transformed in accordance with it. To what degree the powers of social production have been produced, not only in the form of knowledge, but also as immediate organs of social practice, of the real life process... "The development of fixed capital indicates in still another respect the degree of development of wealth generally, or of capital... "The mass of workers must themselves appropriate their own surplus labour. Once they have done so — and disposable time thereby ceases to have an antithetical existence — then, on one side, necessary labour time will be measured by the needs of the social individual, and, on the other, the development of the power of social production will grow so rapidly that, even though production is now calculated for the wealth of all, disposable time will grow for all. For real wealth is the developed productive power of all individuals. The measure of wealth is then not any longer, in any way, labour time, but rather disposable time"

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Karl Marx, Grundrisse, p.700 ff

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Automation and t

According to one account in 2013, 47% of jobs in the USA risk being automated away within "a decade or two".[1] That prospect has been interpreted as utopia or as dystopia. The near future will be one of networked individuals freed from drudgery by automation, and able easily to get what they want to consume and to undermine all hierarchies. Or: only a techno-elite will retain employment and wages. The rest of us will be reduced to a new pauper class vegetating on "universal basic income" handouts.

Further research has queried the projections. Many tasks can be automated, but jobs involve more than those tasks. Capitalists may hope and even believe that they have reduced labour processes to routines laid down by the boss, but "the supposed simplicity and routine character of assembly work is not all that simple... assembly work is also packed with different aspects of non-routine tasks and the capabilities to cope with them". Human labour is more likely to continue, complementing automated procedures, than be completely replaced by them.[2] Even when capitalists could in theory automate jobs, often (in other than a few high-volume contexts) they will find it too risky to make the huge investments required, or too expensive to do that at any foreseeable wage level. Especially so in current and foreseeable conditions of slow and erratic growth, and wage depression.[3]

Some sectors will see big job cuts, but, overall, outside of slumps, we're likely to see more jobs working with new technologies, and more jobs overall. The statistics since 2013 show not the zooming-away that the techno-enthusiast writers suggest, but exceptionally slow growth in US labour productivity. The UK is even worse. For a whole era now across the richer capitalist countries, industrial investment has been low, the proportion of surplus-value siphoned to consumption high, and growth of productivity mediocre.[4]

More jobs have poor and insecure hours, wages, and conditions. Overall job numbers are not dropping. As of 2018 the USA had its lowest unemployment rate since 1969. Fast food bosses were complaining of labour shortages.[5] The UK's unemployment rate is the lowest since the mid-70s. The UK's labour-force participation rate is at record highs. The USA's is higher than it was before the late 1970s. It is down from its late-1990s peak, not so much, it seems, because of anything to do with automation as because of the USA's epidemic of prescription opioid use, and consequent ill-health.[6] After a long history, back to the 19th century, during which the average working week was slowly shortened, it has now been stuck around the same length in the USA since 1980,[7] and has been increasing in the UK since around 2009. Some economists have argued the contrary of the techno-enthusiast thesis: that for the next while at least the USA, and probably other richer capitalist countries, are set for more stagnant economics than at any time since the late 19th century.[8]

The techno-enthusiasts have counter-arguments[9]. The growth of microelectronic capacities is exponential, in line with Moore's Law: computer processing powers double every two years. Big technological innovations generally feed through to increased productivity only with delay, through the detailed engineering follow-up. For example, the productivity advantages of shifting from steam engines to electric motors mostly came from the 1920s (in the USA). That was 40 years after the first electricity-generating power station and 30 years after electric motors went from experimental to commercial. That the new computer technologies have not yet boosted productivity much is just the usual delay. And now information technology and artificial intelligence are on the verge of qualitative new breakthroughs.

Information technology is expanding from tasks where we give the machine exact instructions in advance to tasks which the machine learns to improve on. The scope for machine learning increases with "big data". Data volumes double roughly every two years.[10] As the variety of new technologies grows, also, the possible combinations of them grow even faster.

But it is over 70 years now since the first computers. Almost as long since commercial transistors. We have had 60 years of "artificial intelligence" and "machine learning", with waves of optimism about their potential (as today) and waves of pessimism. Twenty-odd years since people started talking about "big data". Nearly sixty years since the first industrial robots, and forty years since they started "taking off". Over 40 years since the internet was developed, ditto mobile phones. 40 years since the first widely-used PC. Over 25 since the internet "took off". 32 years since the economist Robert Solow commented "you can see the computer age everywhere but in the productivity statistics".[11]

Capitalists have deployed new information technologies very widely. If manual typewriters are still used in India and Brazil, it is not for lack of internet: it is because the electric power grid is unreliable.[12] As capitalists have spread the technologies, they have also drastically changed areas of the workforce. We do not have to speculate about that. It has been happening for half a century or more, and often faster than now. There are decades of experience with the transformation of industries by information technologies. New technologies, by definition, are new, and will introduce new patterns. Yet we can and should learn from past "shocks of the new".

The car industry uses about half of all industrial robots. But the story there is not just of workers being replaced by robots. The collapse of Detroit's economy, in the USA, has been just as much about car production being moved to the anti-union southern states of the USA. There are not many fewer car workers in the USA, overall, than there were in 1979. Many old jobs have been destroyed, new ones generated.[13] Ports are (slowly) being automated, and that is changing port jobs and displacing labour. The displacement of labour is less drastic than from containerisation, which in UK ports reduced the dock labour force by about 90%. Traffic has increased. The total number of "logistics" jobs (using new information technologies for stock control etc.) has increased fast, and the number of "logistics" jobs at and around ports (for example, in areas like the warehouse hub in the "Inland Empire" of southern California) has probably not fallen at all. Old jobs have gone, new jobs have been generated. Sometimes, as in Britain, union strength has been shattered and wages have been forced down on the waterside; pretty much everywhere, the port unions have failed at organising the new jobs a bit inland. The story is more complicated than just new technologies cutting overall job counts, and certainly more complicated than just information technologies cutting overall job counts.[14]

With the steep fall in transport costs since containerisation, the clothing industry has largely disappeared from relatively high-wage economies and grown in Bangladesh, Vietnam, Cambodia, India, Sri Lanka. That is not a story of information technology wiping out jobs. The sewing-together of garments remains little-automated, relying on old technology (the sewing machine). Machines find it difficult to manipulate materials which are soft and flexible enough for clothing. Jonathan Zornow claims he has a new technology which will stiffen the material temporarily for it to be shaped and sewn automatically, and then return it to being soft and flexible. Maybe that will automate the industry. Maybe not.[15]

The ratio of "white-collar" to "blue-collar" jobs has risen, but the biggest eliminations of whole categories of worker by computer technologies have been in "white-collar" jobs. There were 0.4 million telephone operators in the USA as late as 1970. There are almost none now. "Typing pools" and the armies of clerical workers who did calculations by adding machines have disappeared. Some jobs introduced in the early microelectronics era (computer operator, data-entry keyer) have been wiped out by its later years.[16]

The technologies are still being developed, and will continue to change workforces. But "this changes everything, and makes the previous experience of capitalism inapplicable"? That remains to be shown, as it did in the 1950s, the early 1960s, or the mid 90s, all of which saw similar automation-hype.[17] South Korea and Singapore have much bigger densities of industrial robots than other countries. Yet the job categories found in other developed capitalist countries have not disappeared there. Unemployment in South Korea has varied between 3% and 4% since the start of the century, with spurts above 4% from time to time attributable to the usual capitalist mechanisms (slumps) rather than to technology. Labour force participation there continues to rise.[18]

The US Bureau of Labor Statistics produces projections of which jobs will expand between now and 2026, and which will contract. Some of the jobs which techno-hype writers name as about to be trashed by new technologies are

the working class

By Martin Thomas

listed by the BLS as expanding fast. Lawyers? Accountants? About to be displaced, they say, by better computerised searches on legal records, by computerised "smart contracts", and by computerised accounts and analysis of accounts. Yet "lawyer" is named by the BLS as the job in which there will be most new openings for those with more than a first university degree. The BLS expects "paralegal" jobs, with lower qualifications, to grow faster again. "Accountant" is the fourth-highest new-openings job for those with a first degree. Techno-hype writers stress how technology will transform the health-care industry. The highest-ranked new-openings job for those with a first degree is nursing. The BLS predicts "health-care assistant" jobs, with fewer qualifications, will grow even faster than nursing. The job sector highest-ranked for new openings not needing a degree is "personal care services". New technologies are developing in that sector, but there is no indication of of those technologies displacing jobs entirely, rather than mostly creating new jobs complementary to new technologies. The area where most jobs will be lost, says the BLS, is the one which is already losing most — backroom office work. The BLS is extrapolating from what is happening now. Always guesswork; but that the past is no guide to the future remains to be proved. Already junior lawyers in big law firms use sophisticated computerised searches, and use the time saved from searching on drafting legal advice and contracts. Result: more legal business — and more lawyers despite the increased productivity.[19] And accountants? More financial data collated, more analyses of it, so more accountants despite more of the job being done by computer. Retail work has been transformed by technology over recent decades more than most. Supermarkets. Malls. Barcodes (from the 1980s). Electronic tills and payments. Automated stock control and ordering. Self-check-outs. On-line shopping. The BLS expects retail jobs to grow much slower than the average to 2026, but even those not to decrease overall.

Karl Marx, in Capital volume 1 and in passages of Theories of Surplus Value, developed ideas on how capitalism changes labour.[20] Comparing those ideas with the facts of recent decades sheds light on the pattern behind those facts, and also shows that some aspects which Marx considered marginal have become important.

Capital, wrote Marx, started with the "formal subsumption of labour", bringing already-formed labour processes under the sway of capital. Workers are brought together in a workshop (simple cooperation); and then the labour is divided into specialties. In that phase (so Marx quotes a capitalist ideologue) "the more skilful the workman, the more self-willed and intractable he is apt to become, and… the less fit a component of a mechanical system". Factories based on systems of machinery, says Marx, allow the "real subsumption of labour". The labour process is defined by the system of machinery, not by the various inherited skills of individual workers. "In the form of machinery, the implements of labour become automatic, things moving and working independent of the workman… The automaton, as capital, and because it is capital, is endowed, in the person of the capitalist, with intelligence and will; it is therefore animated by the longing to reduce to a minimum the resistance offered by that repellent yet elastic natural barrier, man" Meanwhile, "the means of communication and transport became gradually adapted to the mode of production of mechanical industry, by the creation of a system of river steamers, railways, ocean steamers, and telegraphs".

In this new way of organising labour the capitalists push for constant improvement of the machinery. This cheapens production by replacing refractory specialised workers by machine-operators, more easily replaced, more easily trained, more apt for flexible redeployment, and to some degree organised and paced by "the automaton" itself, and by replacing some categories of workers altogether by machines. In one passage Marx suggests the capitalist criterion is simply cheapening. In fact, as Marx's broader argument indicates, it is not. Crane-driving in container terminals, for example, is a specialised job. It takes time and aptitude to develop the skill. A more skilled crane-driver on a good day will move more containers than a less skilled one on a poor day. More than an automatic crane, too, and at lower cost.

Capitalists introduce automated cranes (where they do: the process is slow) because, even if they are slower and more expensive, they work at the same predictable rate each hour, they don't require breaks and shift changes, etc. In a high-volume tightly interlinked system between ship, wharf, and truck or train, control can trump cost. However (and this Marx noted), if wages are sufficiently pushed down, then new machines will not be introduced even though they allow production with less labour. "Hence the invention nowadays of machines in England that are employed only in North America" (where wages were higher).

Marx noted that the new factories, primarily textile mills, employed women and children. Work with a system of machinery required less muscle-power. Women and children would be "more pliant and docile". In time capitalists found that factory women could be as stubborn and rebellious as any men. For direct work with systems of machinery, though, capitalists have generally preferred young workers. Even if not as strong, they are more agile, alert, flexible, and energetic.[21]

Marx saw this mode of production as levelling labour, from the hierarchy of specialties in the old workshop to a division only between the machine-operatives and the youngest workers who fetched and carried, cleaned up, etc. He noted another group of workers "some of them scientifically educated, others brought up to a trade" doing maintenance and repair. In his era that was "numerically unimportant" compared to the operatives. Marx mentioned "salesmen, messengers, warehousemen, packers, etc.", suggesting that their numbers too were secondary. Elsewhere he gave more emphasis to the diversity of labour: "the product, is formed, one working... as a manager, engineer, or technician, etc., another as an overlooker, the third directly as a manual worker, or even a mere assistant... more and more of the functions of labour capacity are included under the direct concept of productive labour".[22]

Also secondary in number were workers in "entirely new branches of production, creating new fields of labour", as distinct from mechanised or automated versions of older productions like clothing. Marx cited "gas works, telegraphs, photography, steam navigation, and railways". The workers there (in 1861, in England and Wales) totalled 94,000, as against 643,000 in the textile factories, 566,000 in coal and metal mines, and 397,000 in metal-working industries (mostly still workshops).

In some passages Marx seems to suggest that factory operatives would come to dominate numerically. He noted and even stressed, however, that they were far from doing so. The system-of-machinery workers in textile factories were only around 10% of the working class, and only slightly better than half as numerous as domestic servants. "The extraordinary productiveness of modern industry… allows of the unproductive employment of a larger and larger part of the working class". "New ramifications of more or less unproductive branches of labour are continually being formed". "Unproductive" here meant "unproductive" in capitalist terms, i.e. not directly producing surplus-value. (Marx's illustration is that a teacher in a profit-making private school is "productive", but one in a state school is not).

Capital would continually invest in new systems of machinery, to generate "relative surplus-value", but worker-numbers would rise much less than proportionately to production as machines replaced workers. Capital could replace specialised labour by capital-dictated and parcellised routines of machine operation; it could replace some "automatised" labour by machines. Marx denounced the bourgeois economists who argued that capitalist displacement of labour by machinery was harmless, because in the growing economy the workers were sure to find employment elsewhere. "The labourers… thrown out of work in any branch of industry can no doubt seek for employment in some other branch… Even should they find employment, what a poor look-out is theirs! Crippled as they are by division of labour, these poor devils… cannot find admission into any industries, except a few of inferior kind, that are oversupplied with underpaid workmen..." Moreover, if "accumulation [of capital] in-

creases the demand for labour, it increases on the other the supply of labourers by the 'setting free' of them, whilst at the same time the pressure of the unemployed compels those that are employed to furnish more labour".

Thus the constant revolutionisation of machinery would constantly regenerate an "industrial reserve army". "It is true that in the long run the labour that has been released together with the portion of revenue or capital that has been released, will find an opening in a new sphere of production or in the expansion of the old one. [But in the meantime] there is nothing to prevent a part of the money capital lying idle and without employment... while at the same time workers who have been displaced by machinery are starving". That process would allow for the continuation alongside advanced industry of "industries of inferior kind", smaller-scale, less mechanised, relying on low wages. For his time Marx mentioned particularly home-working and, as we've seen, domestic servants. Marx denounced conditions in the factories. But, he argued, "all the horrors of the factory system, without participating in any of the elements of social progress it contains" would be generated in the less-integrated, less-systematised labour which continued alongside.

Marx argued that real wages were generally be higher in more developed capitalist economies. Only, the ratio of surplus-value to wages would also be higher. Thus he also tacitly expected real wages to rise. The common contention that Marx predicted an iron law of immiseration of labour is false.[23]

The 150 years since Marx wrote have confirmed his theory of capital driving to "automatise" labour – to strive to shape it and parcellise it and routinise it as ancillary to systems of machinery – and to automate production outright (displace labour).[24] Those trends were sharpened by the rise from the early 20th century of assembly-line production and "Taylorism" (managers working systematically to extract and codify knowledge of methods of production, and on that basis to take control over the training of new workers, which had previously been the passing-on of knowledge from worker to worker).

150 years on from Marx, workers in "entirely new branches of production, creating new fields of labour" are no longer numerically unimportant. The new branches generally create new specialised jobs. Capitalists then strive to automatise those jobs, but with varying success. Also, the category of jobs "some of them scientifically educated" doing maintenance, repair, installation (and design), and the "salesmen, messengers, warehousemen, packers, etc." have often been little automatised, and have gained greater relative weight.

The production lines of mass-market, more-or-less standardised goods have been steadily automated over the decades, allowing for expanded production together with a not-much-bigger workforce and the elimination or drastic changing of whole categories and jobs. In the USA, "operatives and craft workers" (a wider category than factory production workers) reached their maximum at 34% of the workforce in 1950, and "operatives" alone at 20% the same year. By 2016, 13% of US workers were in "goods-producing" industries (manufacturing, mining, construction). Not all those 13% were production workers. The Bureau of Labor Statistics classifies just 6% of the workforce as production workers — a smaller share than "transport and materials-moving", and only modestly more than "installation and repair".

This trend is mostly not a matter of production moving to other countries. Most countries, including much poorer ones than the USA, including China, now have manufacturing production employment declining as a percentage of the whole.[25] The has been a general relative rise in "white-collar" labour, even in poorer countries. A number of distinct trends are behind that. At the time Marx was writing, the scope for detailed accounting and checking was limited by it all having to be done in handwriting and by hand calculations. Before cash registers and adding machines became widespread, for example (in the USA between the late 1880s and World War 1, in Europe by World War 2), most shopkeepers could not keep detailed records of sales. In that sphere, the introduction of machinery has displaced some categories of labour (hand calculation and recording), but, much more, created new jobs (of analysis of the much greater bulk of data which it is now workable to collect.) In 1880 there were only 2,300 accountants in the whole USA; by 1920, 126,000; in 2018, 1.26 million.

When Marx wrote of capitalistically-unproductive workers, he referred to domestic servants and to the much smaller category, then, of public-service workers (such as state-school teachers). These were workers who suffered under capitalist control. Badly so: "the young servant girls in the houses of the London lower middle class are in common parlance called 'slaveys'" (Marx). But they did not produce profits. He also wrote of a species of competitive, profit-generating "unproductive" workers, in retail and in finance for example. Their labour did not expand the social total of surplus value. And yet, by their labour, they enabled their bosses to draw profits from that social total.[26] Since Marx's day there has been a big expansion of different varieties of capitalistically-unproductive labour. As a result of the efforts of the labour movement, and the reluctant agreement of capitalist classes that they will do better with healthier and more educated workers, there has been a growth of state-funded education and health-care, what could be called "welfare unproductive labour". There is also a growth of spheres where capitalists can make profits which are not new surplus value, but a redirected share of wider surplus value: finance, real-estate, marketing.[27] When competition sharpens, it can be capitalistically rational for each competitor to spend more on marketing and financial manipulation, even though in the aggregate the costs of that marketing and financial manipulation are a deduction from surplus-value produced.[28]

The effects of automation on job structure intertwine with the rise of "services" in household consumption, which is partly a result of the rise in real wages, partly a result of the fact that capitalist marketing is able to expand consumption of "services" faster than it can expand consumption of food (or even of fridges, washing machines, smartphones: one is usually enough, even for the well-off). In the USA in 1869, 44% of household spending was on food and drink. The 24% on "services" was mostly rent (or "imputed rent" for owner-occupiers). By 1940, 22% was on food and 43% on services (of which 13% on housing); by 2013, 8% food, 67% services (of which 16% housing).[29]

Much of the writing on automation assumes that automation hits jobs which are by their nature "routine" and "middle-level". "High-level" jobs (like writing techno-hype articles and books) are assumed to be not automatable. The historical record suggests the assumption is false. The processes of "automatising" jobs and automating them away have often started with specialised jobs in which training, experience, and skill make a big difference, and where workers may have relatively high wages. Automata can do jobs often assumed to be beyond their reach: journalism, personal counselling, many tasks of caring for frail elderly people. An automated artist has had work exhibited in galleries. Automata can do calculations more complex than any human could do. They can check mathematical proofs; in fact, proofs have been produced which no human can check without a computer.[30]

Service industries, and "high-level" jobs in service industries, can often be automated. Yet automation in those industries often leads to an expansion of "service" production and of new jobs working with the machines. A skilled typist had many skills other than basic dexterity (literacy, comprehension of what was being typed, knowledge of how to set out different sorts of documents), and would be much faster and more accurate than a less-skilled one. But the abolition of typing pools has not emptied offices. The introduction of cash registers, adding machines, calculators, mainframe computers, and then networks of desktop computers has led to a great expansion of employment in accounting, stock control, logistics, etc.

Among jobs required advanced higher education, the BLS predicts the biggest percentage increase in numbers for statisticians. Statisticians are automating their computations more and more[31]. But that means many more statistical analyses can be done, on data which is collected more and more cheaply.[32]

The new jobs generated as complementary to automation are often "real" jobs, producing real benefits. Others are generated as a result of the expansion of "competitive-unproductive" labour, in finance for example. And yet others are generated and sustained because capital's drive for control over labour is fallible. Sometimes it produces only costly simulations and pretences of control, or "displacement activities" which information technologies also facilitate: box-ticking, patching-up, writing of reports or collating of statistics which no-one reads.

It generates "bullshit jobs" (and "bullshit" work within jobs which are not fully "bullshit").[33] After writing an article on the theme, David Graeber received 110,000 words of testimony about "bullshit jobs"[34] and a poll in which 37% of all respondents in the UK described their jobs as "bullshit". His evidence remains mostly anecdotal, but he digs up figures showing an expansion of back-room jobs (such as marketing, PR, etc.) in US universities much faster than the expansion of student or teacher numbers. Graeber considers the "financial industry... a paradigm for bullshit job creation". It uses high technology. Most of the transactions in many financial markets now are automated trading. But that means more transactions and more jobs.

Among Graeber's categories of "bullshit jobs" some are "competitive-unproductive" — "lobbyists, PR specialists, telemarketers, and corporate lawyers" — often jobs which use advanced communications technologies and could not emerge on a comparable scale without those technologies. As Marx put it in Capital, pioneer capitalists often had an austere dedication to accumulation. Then "when a certain stage of development has been reached, a conventional degree of prodigality, which is also an exhibition of wealth, and consequently a

source of credit, becomes a business necessity... Luxury enters into capital's expenses of representation". It is expressed not only in shiny offices, but in the creation of managerial retinues, often with bombastic job titles.[35] Those are at the top end of what Graeber calls "flunky jobs". At another end, domestic-servant jobs, which were 8% of all jobs in the USA in 1870, and declined to become statistically insignificant by about 1990, are increasing again. An unofficial estimate is 1.4% of the workforce in the USA.

In the expansion of "box-ticking" labour, there is a factor additional to what Graeber calls "managerial feudalism". Neoliberalism, despite its own claims, has not so much "deregulated" as created a new web of regulations intended to be market-facilitating or market-simulating.[36] They are often more complex, in ways which would not even be thought of without post-1980s information technology and its capacities for collating large amounts of data. A similar thing happens with out-sourcing: it means more contracts, more contractual provisions to be checked. With neoliberalism, then, information technology is facilitating an expansion of reports, submissions, and "compliance" and "box-ticking" labour. The BLS reports that the number of "compliance officer" jobs in the USA almost doubled between 1997 and 2018 (to 0.3 million).

In "welfare unproductive" sectors, also, new technology may well increase, not reduce, jobs. As late as the 1970s, there had been almost no new technologies in schools since the coming of printed books, other than the blackboard, the exercise book (made workable by paper becoming cheaper), and the pencil (all mid 19th century). The "spirit duplicator", allowing maybe 30 or 40 copies of a handwritten sheet, had been invented in the 1920s; in the USA multiple-choice tests had been often used, with automatic marking, since the late 1930s; and ballpoint pens had been widely used from the 1960s. That was about it. Now there are computer networks, laptops, tablets, photocopiers, interactive whiteboards... There are sporadic drives to get more systematic managerial control over teaching — to "automatise" it — and from time to time techno-optimists talk of computerised learning replacing education workers. In fact, though, living labour has not been removed. Teachers work more with new technologies. Schools add new job categories such as IT workers. The BLS expects education admin worker numbers to grow faster than teacher numbers and faster than the overall workforce. New technologies also facilitate the accrual in schools of "bullshit work".[37]

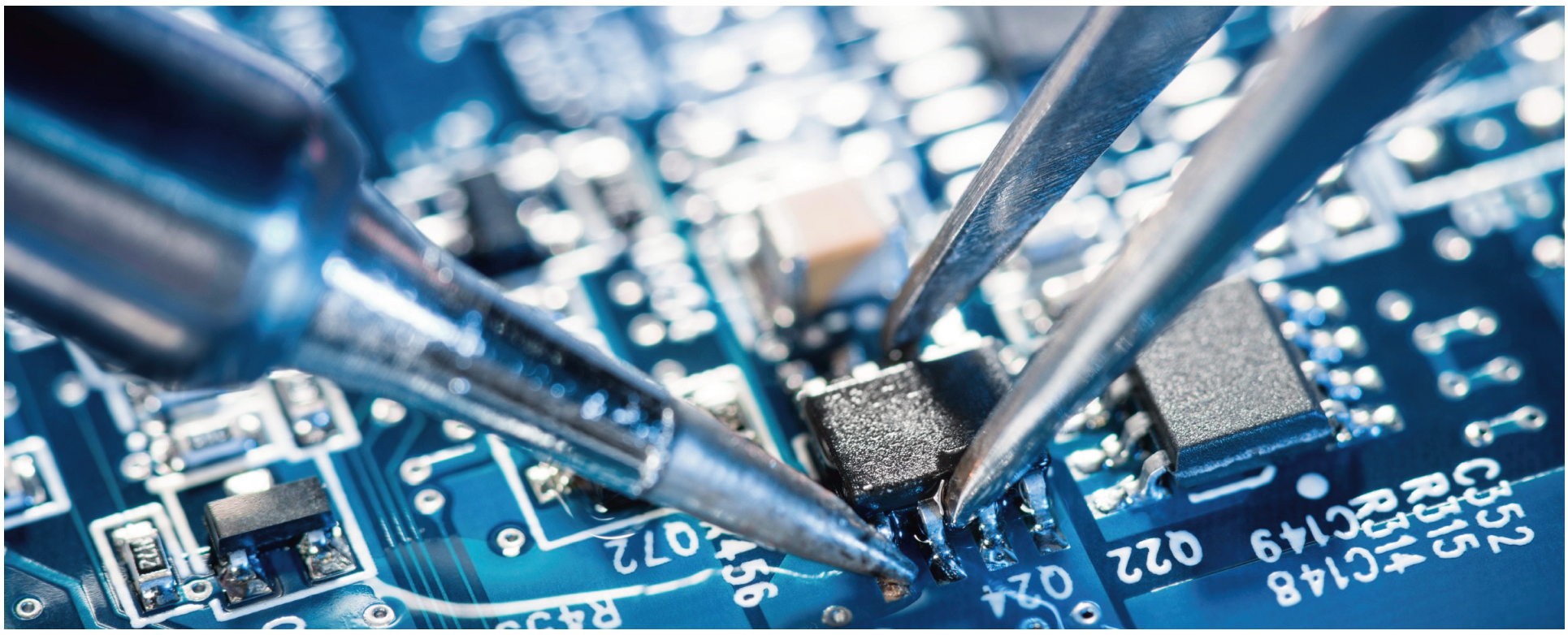
The fever of technological leaps may accentuate big slumps, with resulting high unemployment. The 1920s and 30s in the USA were a time of fast technological advance as well as of the Great Depression. But the unemployment will come through slumps, not as a direct or automatic consequence of the new technology. Capitalist deployments of new technologies have displaced large numbers of workers, leaving them destitute or unable to "find admission into any industries, except a few of inferior kind, that are oversupplied with underpaid workers..." Big new deployments are likely to continue to do that. Capital is restructuring labour, destroying old jobs and creating new ones. That will happen faster and more widely if unions increase our strength and force higher wages, but it will happen anyway.

In the last 40 years or so, trade unions have too often let themselves fall back into managing gentler and easier decline for "legacy" workforces in traditional bastions, and failed to organise new sectors and younger workers. Unions need to change that approach, to reach out wider, and to fight for a shorter working week. In large areas of the global South, "Industrial Revolution #2" has yet to arrive (clean water, electrification, good food supplies), even though "Industrial Revolution #3" may have made big advances in those same areas.

If microelectronics is "Industrial Revolution #3" (after steam engine #1, electrification #2), then India shows that in some ways #3 has already spread wider than #2. In India, mobile phone connection numbers are 84% of household numbers, 66% of households have TV, 24% have smartphones, 13% have PCs. But only 18% have piped water (and that often only some hours a day); although about 88% have some electricity supply, it is often unreliable; only 27% have fridges, and only 5% motor vehicles.[38] Such combinations generally produces the job-cutting effects of "Industrial Revolution #3" in the cities while "Industrial Revolution #2" is transforming agriculture and driving people off the land. The result is much higher unemployment and semi-employment than in countries with more thoroughly advanced technologies.

The climate emergency means that we need not so much more of the same, economically, but rather to reconstruct economic infrastructures, to build new infrastructures where they do not yet exist in the global South, and to expand public provision, while checking some expansions of private consumption. Those tasks will require many new jobs and the best use of new technologies to do the tasks fast enough.

What will not happen is technology, in and of itself, creating either a utopia of "fully automated luxury" for all, or a dystopia of everyone becoming unemployed apart from a few "high-end" workers controlling new technologies. The trends which the BLS extrapolates in fact show more incremental and diffuse job-displacement in coming years rather than more cases of the rapid wholesale abolition of job categories (typists, telephone operators, etc.) typical of the last few decades.



Trends may change. Some sudden new leap in microelectronics technology may emerge and get applied widely and very fast. The probable result will be faster and bigger displacement of some sections of workers, and great enrichment of the capitalists using and producing the new technologies. Despite expanding productivity, capitalism is far from reaching "peak stuff".[39] It has not moved on from the competitive acquisitiveness described by Marx in his 1844 Manuscripts: "Private property has made us so stupid and one-sided that an object [or we might say, a service] is only ours when we have it" (i.e. as private property). The top 5% in the USA account for 38% of all household consumption.[40] Capital's capacity to get them to desire more hotel and restaurant services, more luxury watches, bigger cars and houses, more expensive education for their children, etc. is still strong.[41] If a new technological leap gives them a boost, they will spend their riches on more consumer goods and services, on hiring bigger retinues, or on developing new businesses. As a result, businesses will need workers. The dislocations of the new technology will make it easier to get those workers cheap (including for jobs which at higher wage-rates would be automated).

A stronger labour movement could instead intervene in the processes of new technology to begin reducing weekly working hours again. The outcome depends on class struggles, and not just on technology.

• Thanks for comments on and criticisms of earlier drafts of this article by Janet Burstall and Bruce Robinson, especially.

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[1] Frey/ Osborne

[2] Quote from Pfeiffer. Autor, and Autor/ Salomons, document the "complementary jobs" thesis in some detail; Arntz, the thesis that automating away tasks doesn't mean automating away jobs. Acemoglu/ Restrepo, in another large econometric study, find that a newly-installed robot in the USA displaces between 3 and 5.6 jobs, but new IT capital more broadly tends to augment job counts. Despite their headline claim about "47% of US jobs at risk", Frey/ Osborne (pp.42-44) are explicit that they "make no attempt to estimate how many jobs will actually be automated". They suggest that more and more will be automated because "labour is the scarce factor". Even a beginning of mass "technological unemployment" would make labour not "scarce" at all, and facilitate wage depression or stagnation (as is already happening in the USA since the 1970s, and the UK since 2009), thus slowing automation. For example, all restaurant cook jobs figure in Frey/ Osborne's list as among the most "at risk" of being automated, but what fast-food chains are in fact automating now is order-taking

[3] Moody

[4] Husson; Moody

[5] New York Times 3 May 2018 nyti.ms/2Rp9KGK

[6] BLS Monthly Labor Review March 2019 bit.ly/bls-opi. Life expectancy in the US has fallen since 2014: bit.ly/us-le

[7] For USA: Friedman. For UK: bit.ly/w-hours. Break times within the working week have also been reduced in the USA: Moody p.11.

[8] See Gordon and Rachel/ Summers for different versions

[9] See Brynholffson/ McAfee; West; Ford

[10] bit.ly/big-da

[11] bit.ly/solow-pp. Gordon discusses the rejoinder sometimes made that the productivity boost from computers is underestimated because statistics do not adequately capture improvements in quality arising from IT. He argues that this underestimation bias was actually greater for previous new technologies.

[12] bit.ly/type-w. 52% of households in Brazil have computers, and 49% internet access (World Bank). Power cuts in Brazil: bit.ly/brazil-c

[13] BLS figures, Moody p.9, and Singleton 1992

[14] El-Sahli and Upward show the number of dock jobs falling fast from the 1960s to 1991, but then levelling off. bit.ly/ports-j. See Moody for logistics jobs more generally.

[15] bit.ly/sew-rbt

[16] BLS

[17] bit.ly/auto-64; politi.co/2TJhEte 1950s; Rifkin 1990s

[18] bit.ly/korea-p

[19] Even with "smart contracts" (the concept dates to 1994) "the initial negotiation of the terms of a contract would still be reliant on traditional legal services" (Thomas)

[20] Mostly Capital vol.1 chapter 15 and Theories of Surplus Value Part 2 ch. 18

[21] On young workers in the electronics industry today, bit.ly/young-el. Maybe the elimination by automation of many jobs operating and feeding factory assembly lines (though by no means of whole workforces) is a push behind the influx of young workers into industries like fast food, and the higher rates of unemployment today among young workers (when in the 1930s unemployment was lower among young workers than older ones)

[22] Marx 1864

[23] In the 1960s and 70s, especially, many writers claimed that working-class affluence had proved Marx's whole theory wrong. But if the economist and "techno-sceptic" Robert J Gordon's shoal of evidence against the idea that "Industrial Revolution #3" is more revolutionising than "Industrial Revolutions #1 and #2" is right, and he presents a shoal of evidence, then most of that access to "affluence" of the working class, in the USA at least, took place not in the era when writers were claiming loudest that affluence had proved Marx wrong, but in the era of Marx, Engels, Lenin, Luxemburg, and Trotsky. If the bourgeois apologists did not have enough evidence to prove Marx, Trotsky, etc. wrong, then all the more they don't have now. The "entirely new branches of production" which Marx had identified - machine-producing not the same things as of old more economically, but entirely new things – opened the way for US workers to get their homes, as Gordon puts it, "networked" as they had not been in 1870. They got connected to water, sewage, electricity, gas, phone, mail, radio, movies. They got fridges and washing machines. Thanks to paved roads and cars, they could move outside their small town or neighbourhood. They mostly had high-school education. They benefited from publicly-enforced food and public hygiene standards, which drastically reduced the impact of infectious diseases (as distinct from the still-unconquered chronic diseases). They had weekends and annual holidays. Income-per-head figures underestimate improvement (in productivity and in life standards) more in that era than in others. First, many of the new goods working-class households had improved fast in quality as they fell in price. Second, some of the "networks" had an equalising tendency. Before, for example, the women in poorer households spent hours per day carrying heavy loads of water, often unclean water. Richer households had servants to get their water, and their own safe wells. Now the piped water was the same for everyone. Many improvements have been won since World War 2 in the USA. More, of course, in Europe and later in some countries of Asia and Latin America, as they "caught up" partially or wholly with the USA. But Gordon argues that the "Industrial Revolution #3" improvements ballyhooed by the techno-enthusiasts have been narrower than those won following "Industrial Revolutions #1 and #2", mostly confined to the sphere of entertainment, communications, and information.

[24] Automation does not always follow on automatisation, but may result from technological innovation bypassing the job. Fundamentally, the computer operator job was "automated" away by real-time processing replacing batch processing, and computers becoming technically more reliable

[25] Rodrik

[26] "The unpaid labour of these clerks, while it does not create surplus-value, enables [the boss] to appropriate surplus-value, which, in effect, amounts to the same thing with respect to his capital. It is, therefore, a source of profit for him" - Marx, Capital volume 3, chapter 17

[27] Finance capital also draws surplus value direct from households: see Lapavitsas

[28] Moseley and Mohun have researched the rise of unproductive labour in the USA. Mohun has found that in recent times the proportion of unproductive workers has stagnated, but the proportion of income going to unproductive labour has risen, because of high pay for many finance workers and managers. The BLS, drawing on recent experience, expects job numbers for "market research analysts and marketing specialists" to grow 23.2% between 2016 and 2026

[29] Gordon Table 2-2

[30] For mathematical proofs, see Keith Devlin bit.ly/devlin-4c. For automated counselling, vshade.com.au. For robots in care for the elderly in Japan, bit.ly/care-rob. For automated journalism, Andreas Graefe, bit.ly/graefe-j. For automated art, bit.ly/auto-art

[31] SPSS - the Statistical Package for the Social Sciences - was launched in 1970 and has been much developed since.

[32] For some big caches of data, statistical analysis falls down, and in recent years other mathematical tools (topology) have been more fruitful

[33] In the USA the job category "management analyst" (or "management consultant") increased from 127,000 employed in 1997 to 684,000 in 2018. Marx on some other categories of unproductive labour: "With given conditions of production, it is known exactly how many labourers are needed to make a table, how great the quantity of a particular kind of labour must be in order to make a particular product. With many 'immaterial products' this is not the case. The quantity of labour required to achieve a particular result is as conjectural as the result itself. Twenty priests together perhaps bring about the conversion that one fails to make... The number of soldiers required to protect a country, of police to establish order in it, of officials 'to govern it' well, etc. - all these things are problematical... although how much spinning labour is needed to spin 1,000 lbs. of twist is known very exactly in England. As for other 'productive' labourers of this kind, the concept of them includes the fact that the utility which they produce depends only on their number, consists in their number itself. For example, lackeys, who should bear witness to their master's wealth and elegance. The greater the number of them, the greater the effect they are supposed to 'produce'." Marx also names doctors as among those where the supposed product has no clear relation to the labour. That is not convincing: after all, some tables need an elusive quantum of carpenter-labour. But what Marx writes about priests, officials, etc. surely applies to "managerial" labour, and what he writes about lackeys corresponds to Graeber's "managerial feudalism".

[34] Graeber pp.28ff

[35] “Chief future officer”, “chief joy officer”, "chief happiness officer”, “chief thinking officer”, “chief vision officer” (each of whom of course will have deputies, assistants, etc.): Izabelle Kaminska, Companies need fewer mystics and more critical thinkers, Financial Times 19/2/19

[36] See Panitch/ Konings and Aalbers

[37] Graeber writes about the expansion of bullshit work and bullshit jobs in universities, and shows it has been worse in private US universities than in public ones. Students are now advised to consider university education an "investment", but maybe in fact universities have gone through their own processes of unproductive-labour-inflation and become less adapted to the world of work than they were in days gone by when they were closely tied to training lawyers, doctors, teachers, clerics, and officials. As "credentialism" expands, more and more a university degree is taken by employers as a signal that a worker is generically adapted to jumping through hoops. Any degree. The particular knowledge retained (or not) from university studies is secondary. See nyti.ms/2KYACbp on "degree inflation" and Spence on signalling. The universities themselves, as bourgeois institutions, have an interest in this "degree inflation" and in the proliferation of e.g. business degree courses with little intellectual content. "Business" accounts for 19% of all degrees in US universities, 69% more than the runner-up area, all health-related fields of study totalled: bit.ly/bus-top. See also bit.ly/bus-deg.

[38] Financial Express bit.ly/india-tv for TV; Unicef bit.ly/india-w (and Hindustan Times bit.ly/india-ht) for water; World Bank bit.ly/india-pc for PCs; bit.ly/india-m for mobiles; bit.ly/india-e (and Times of Indla bit.ly/india-out) for electricity; Pew Research bit.ly/india-sm for smartphones; The Hindu bit.ly/india-fr for fridges; Indian Census bit.ly/india-mv for cars

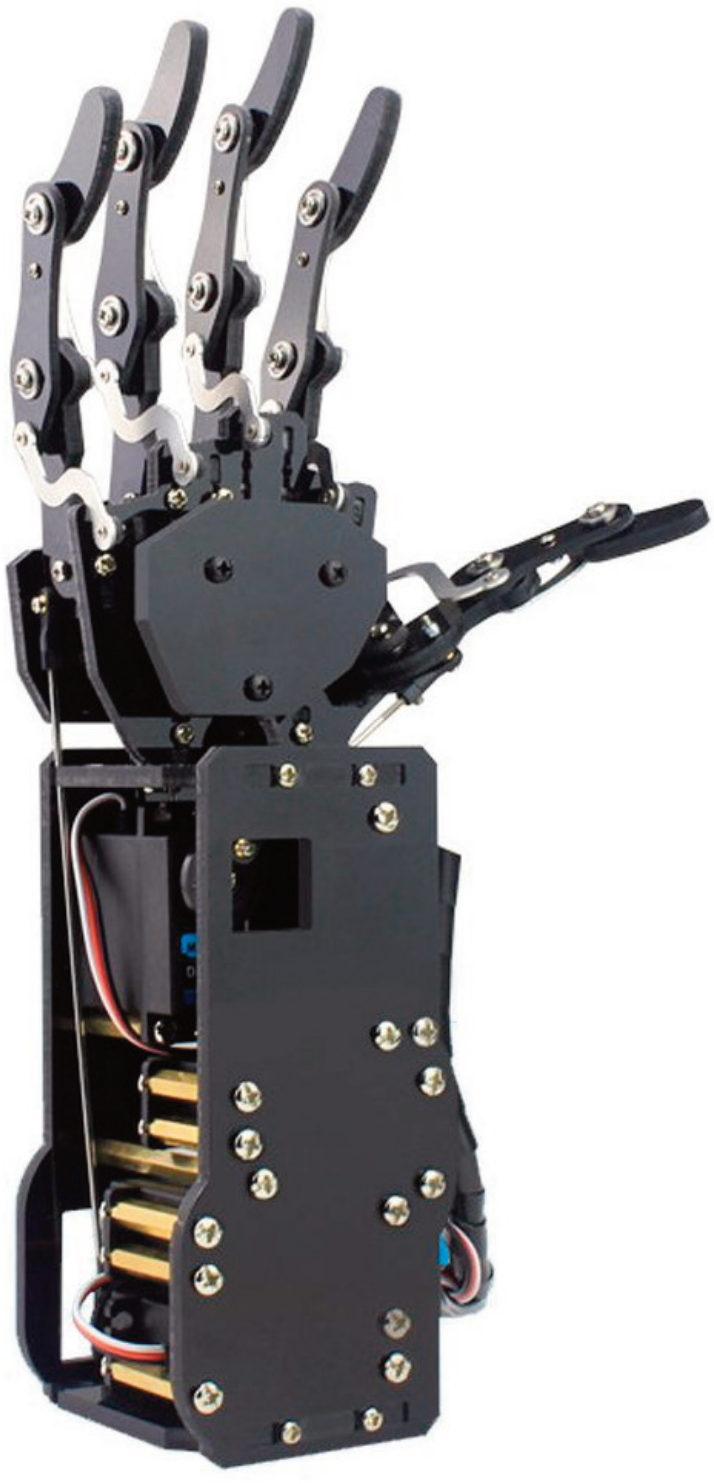
[39] bit.ly/peak-st

[40] Ford

[41] The watch industry was perhaps the first factory industry, one with a developed craft division of specialised skills (Marx, Capital vol.1 ch.14/3). Those specialised skills proved resistant to automatisation until, in the 1970s, they were bypassed by the invention of the quartz digital watch in place of the mechanical watch. By 1987 the number of jobs in the Swiss watch industry was reduced to one-third of what it had been in 1970. It has since then doubled again, with a boom in luxury mechanical watches, but with jobs at (by Swiss standards) low wages. bit.ly/swiss-w

The future and robots

By Charlie Applebaum



Fuelled by rapid developments in technological innovation hyped in recent years, although mostly developed over the last two decades, many cerebral types suggest we may be at the start of some significant changes in capitalist production. They even gave it a grandiose name: “The Fourth Industrial Revolution”.

Socialists, Marxists, progressives have a history of taking technology and advocating its use for more than just the most efficient exploitation. Perhaps however, the pace of innovation is making this harder. The techy elite, a traditionally well-meaning liberal bunch, and the revolutionary socialist crowd tend not to have massive overlap. I would argue that both could probably learn a thing or two from each other. Current and near term software and hardware have properties which many outside of the tech space struggle with and, we, as conscientious socialists need to understand them to advocate their role in a fairer society. I will outline some key innovations: open source software Roughly, this is software that the users have the freedom to run, copy, distribute, study, change and improve. Thus, “free software” is a matter of liberty, not price.

To understand the concept, you should think of “free” as in “free speech,” not as in “free beer”. The logics and algorithms that control our lives should not be a black box owned and run in secret by wealthy corporations. There is some evidence that this situation is improving. One recent industry survey concluded “Open Source is the foundation now for nearly all applications….. Open Source development has gone from the exception to the rule”. Millions of dollars of software is now available for free on the internet, but we must recognise most of the means of production are still run with non-free software. OSS is also interesting in an economic sense in that as a digital goods it has the unusual property of zero cost for duplication, and just look at the history of napster to see how capitalism struggle with these emerging types of commodities. Whilst OSS growth is good, socialists should be advocating for much more, starting with urging government to open source all of its work. Most socialists are familiar with the idea of a workers’ cooperative or public ownership but fail to see how non-free software continues to be used for exploitation and profit. If really is going to be a widespread replacement of people by machines in workplaces then exploitation and inequality will increase more if we do not get control of the software that will be controlling our lives. “The Cloud” To understand the cloud, you need to understand what came before it.

Previously, when an organisation built a new IT venture it took weeks to get it running. Someone would have to select hardware, wait for delivery, assemble and configure it before a developer could run a new application on it. Then they would set up monitoring, backups, redundancy, and add batteries and generators to keep it running during outages. Contrast that now with one new cloud service, Zeit. Once installed, in a few minutes you can type “now” at a command line and everything — servers, DNS, databases, backups, storage — are all provisioned and published on the internet in 5-10 seconds. Widespread automation in IT jobs, the low hanging fruit for automation, has already happened. Compute, the ability to run some arbitrary software of your choice, is now available to society with about as much friction as getting water out of a tap. Whilst most people cannot do their own plumbing, the end product of running water is ubiquitous and low cost, and Compute is no different.

The bedrock of modern automation is cloud based servers, the cheapest of which is around four dollars a month (AWS). Capitalism has driven costs down to the point where it could be free at the point of delivery if society wished it, at least in those countries with reliable power and connectivity. However we must be cautious. Take market leader Amazon — it’s business model is no longer to become the most successful online retailer. That was achieved years ago. Consider the rate they are investing in logistics, physical stores and even media. They recently purchased Whole Foods in the US, in part for their massive number of high street stores and large logistics network. Amazon want to be the very fabric and infrastructure of capitalism. Underpinning every purchase, payment, fulfilment and delivery, taking a slice at every point, with little democratic oversight and of course, terrible labour conditions.

Modern capitalism has granted us the tools to run all software, all computing, upon this amazing infrastructure for almost nothing. What would socialists do with this digital infrastructure? What might capitalism do next? You only have to look at the drone-like picking staff in Amazon’s warehouses to feel a chill, where routes, pick rates and break times are commanded by digital supervisors running on cheap cloud platforms and hard to automate tasks like shelf picking are done by low-pay workers.

It turns out that managers are far easier to automate than workers, and tasks like picking are still among the most challenging. The first robot, named Unimate, was made in 1954 to move hot car parts for GM. Now reflect on the recent deluge of robot sci-fi — Westworld, Ex Machina, Her, Black Mirror — in this vision of the near future autonomous human like robots will be stronger than us, smarter, bordering on self awareness … and mainly used as human shaped sex toys. Sadly the reality of lifelike robot companions is a long way off. The most advanced human like general purpose robots are basically rubbish, and about as sexy as a Dalek. After 60 years of slower-than-expected progress in robots, recently acceleration can be observed, often funded by military research. However, most of the developments are less to do with the machinery itself — the actuators and motors — and more to do with developments in control software. The technology needed for impressive automation has been advanced for many

years — just think of car production lines. However in the production lines of the most profitable company on earth, it still takes over three hundred pairs of hands to make one iPad. Until very recently we lacked the capability to operate the robots with sufficient sophistication without human control, but developments in AI software have started to change this.

For example, take the exciting subject of sorting of mixed recyclables. Once done by armies of humans leaning over conveyor belts, now image recognition cameras and high pressure air hoses can sort recyclables with greater efficiency. Sort quality improves as hard to classify objects are done by human operators and the machine learns over time. These developments suggest impressive but boring single purpose robots moving out of the factories and further into our lives.

And like the flat screen TV, expect the cost to be extortionate at first and plummet as economies of scale kick in. There also seems a tendency of underestimating the old or mundane, and exaggerating the impact of the shiny and new. Take the washing machine — utterly boring — and yet probably the most empowering labour-saving robot humanity has created so far. For every article you read of dystopian robotic futures and widespread unemployment remember the washing machine. Expect automation in the next 20 years to look a lot more like a washing machine than a sexy robotic butler. Driverless cars are probably the next big significantly disruptive robot.

There is one major thing holding back the armies of robotic workers: the nagging red flash of the “charge me” indicator. Until very recently batteries have not had dramatic increases in energy density in decades. Modern lithium ion batteries were invented in the 70s, commercialised in the 90s, and had little major investment until recently. Smartphones, electric cars like Tesla and “green energy” markets have incentivised corporate R&D and gained greater state sponsored research. Papers published in 2016 suggests a 10x improvement in energy density is possible. When this becomes mass market it opens the door for many more types of automation. Battery technology has historically shown slow improvement compared to processing power, but by the time your iPhone can last one full week maybe you will start to find your job will not.

Much like cheese and Brexit, AI comes in two flavours — hard and soft. Hard AI, or artificial general intelligence, is the ability to apply knowledge to solve unseen problems. To be able to fully translate a book you need to fully understand the reasoning of its author. While tools like Google Translate are improving quickly we are a long long way from this type of automation being perfect. In 40 years time however many experts think hard AI will start overtaking humans in most general tasks. Soft AI, or artificial specific intelligence is far more immediately relevant. It is based on statistical learning on large sets of training data to solve complex problems in narrow well defined fields. Think Netflix’s video recommendation engine. So far soft AI has rarely replaced human workers, instead tackling problems at a scale where human labour is not economically viable. If it took you an optimistic 10 seconds to review the viewing habits of a Netflix user and recommend them a new show, it would take you 70 years of nine to five work to complete the full task just once. In fact, in this example we have actually created new jobs as someone needs to build and maintain the recommendation engine rather than the AI replacing human labour.

Here are some examples of soft AI. Google deepmind can already learn and complete the computer games from your childhood with zero human input. As good or better than you in 49/57 games after a few hundred attempts. No human intervention required. News being written by machines. Speech and image recognition took massive leaps in the last year. Subtitles, and categorisation are almost solved. Drones. While the machinery is not new, the brains are. Combined with the ubiquitous fast reliable network and better batteries and the potential for automation are interesting. Self driving cars. They are already here!

Whilst profit is the principal motivation for decision making, a machine is usually chosen to replace a human when the cost savings far outway the typical drop in quality. Beyond pro-chess, it is actually pretty hard to find real world examples where current generation AI is actually better than humans and already be capable of replacing workers. Two interesting cases that have been studied and proven to be significantly better done by a machine are the role of a pharmacist in handing out medicine and spotting complications (but who stacks the machine!), and that of a lip reader where machines already outperform humans on average error rates. Impressive stuff no doubt but not quite the doorstep of mass unemployment that many fourth industrial revolutionists prophesise. More commonplace are examples of technology increasing efficiency of a worker when automation is employed as assistive tooling for existing human labour. Soon doctors will be being advised by digital assistants reviewing case notes and analysing patient biometrics for them. This is far less likely to lead to sudden mass unemployment but does present an issue for workers who are less tech literate as job roles change faster than skills, and employers have little motivation to retrain adults under capitalism.

Trade unions have so far addressed these sorts of issues on a very low level, if at all. We should expect this problem to increase and so the job of training workers by unions needs to be prioritised. Jobs that can be boiled down to repetitive tasks that can be scored and quantified are most at risk, and these tend to be medium skill/middle management type responsibilities — accountancy or par-

alegals — but significant change is likely to take a decade or more. When we look at the role of technological change from history it is sensible to expect unpleasant disruption for the affected workers even if society generally fares better. Ultimately in many jobs as machine reliability becomes statistically better than the occasional ingenuity of human insight we will see workers being replaced.

Crystal ball gazing is not the job of serious socialists, but let us consider how we might use the spoils of capitalism were profit not the motivation. Say self-driving electric vehicles become widespread. If that was combined with an open source software platform that was publically run in the open and funded and monitored democratically, you could have an efficient public transport system, resembling Uber, that largely runs itself? Usage or payment could even be managed with digital currency until private transportation becomes a nostalgic pursuit and the public demands transportation as a basic right. We already have all the knowledge and hardware to make this happen so it's not so far fetched as it seems.

The machines are coming There is at least some evidence to suggest the "new jobs" created by the changes may not be enough for full employment under capitalism. Workers in transport, retail roles, cashier, bookkeeping and supervisory work are all easy targets for automation. There are also concerns about a the "hollowing-out" of middle-skilled, middle-wage jobs and "a corresponding rise in employment at both the high and low ends of the skills spectrum". AI, limitless compute and new battery tech suggest that workplace automation is going to increase.

Whilst I disagree that the scale will be "unprecedented", not least because the transition costs are likely to be prohibitive and underestimated, there seems to be some merit that the speed of change will be faster than we have seen before. There are some obvious socialist answers here — raising the minimum wage and reducing the working week would help. Bill Gates has suggested a robot tax — but history shows that solutions that will benefit everyone are unlikely to be achieved without significant political will from the majority of people. Socialists need to have more to say on current technological innovation.

Even under a capitalist society the potential for vast improvements in quality of life are huge, and as noisy progressives it is our responsibility to understand them and persuade others of their importance. It is not sufficient to outsource the thinking on technology to the techy liberal elite. These are the tools that socialists will use to liberate the majority of humans from drudgery. We must understand them.

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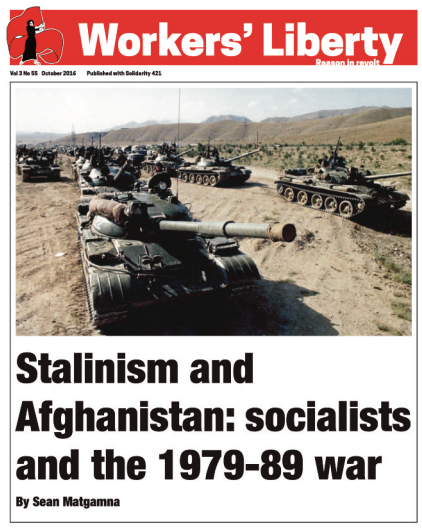

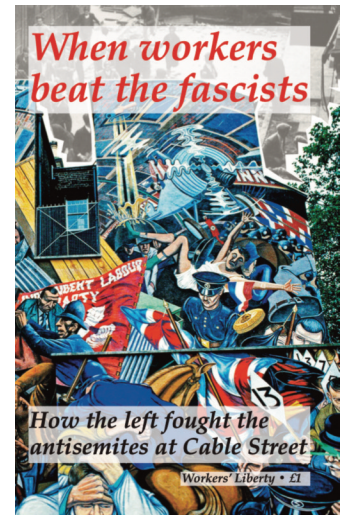

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Hipster reformism and the technological fix

By Bruce Robinson

Back in 2013-14 there was a lot of excitement on the left about "left accelerationism" and the prospect of a transition to a "post-capitalism" fuelled by technological advances based on information. Aaron Bastani coined the meme of "Fully Automated Luxury Communism" (FALC), and it led a fitful life on the Internet. In 2019 it returned in the form of a book which sets out to be a manifesto.

Since 2015 Bastani has moved from a politics rooted in "post-workerist" thinkers to become a born-again supporter of Jeremy Corbyn. The book divides into two parts: the first containing the basis for and outline of FALC as a future communist society near the "end of history", and the second providing a political and economic platform rooted in the present, self-consciously populist and anti-globalist, in which FALC is "a beginning, not a destination". The basic thesis underlying the book is that we are undergoing a "Third Disruption". The first was agriculture, the second industry and the third is based on information. "The defining feature is ever-greater abundance in information." As information goods have a cost that declines to almost zero as more are produced, we live on the brink of "extreme supply", a post-scarcity society delivered by courtesy of technological breakthroughs produced by capitalism. Labour is also no longer scarce (there are a number of economic objections to this, and issues of viability, which I will skip over for lack of space).

On this basis, Bastani details a number of technologies that he claims will resolve contemporary crises. Energy scarcity will be overcome by harnessing solar energy on a massive scale. Raw material scarcity will be overcome by mining in space, using asteroids. Problems of an ageing population are solved by gene editing to prevent genetically determined illnesses. The provision of sufficient food is ensured by the creation of synthetic protein that'll taste as good as meat and by the completion of the Green Revolution of the 50s and 60s that introduced higher yielding crops and the use of chemical fertilisers to countries such as India. These measures combined will enable a slowing and eventual end to global warning. A lot of the book is taken up with advocating these technologies and demonstrating that they are already exist – or are about to – so that in places it reads like a publicity blurb for synthetic hamburgers or reusable rockets.

This is the politics of the technological fix, where social and political problems are taken to have technological solutions. The technologies are assumed to function well and not to have detrimental social, economic and environmental side effects (the Green Revolution is disputed on all three grounds). If you look closely, Bastani has caveats — not quite there yet, but success is just coming. Those are not allowed to tarnish the overall confidence that the technology developed under capitalism will lead to FALC. This is based on the assertion that " capitalism is incompatible with natural abundance". "Facing such conditions… production for profit begins to malfunction." FALC is therefore the conclusion of the Third Disruption – capitalism will be driven by its own dynamics to innovate and thus hasten its own demise.

This represents an extreme but not original reading of Marx which takes his words on the development of the productive forces under capitalism (narrowly understood as technology) to imply its transcendence. Productive forces clash with the social relations of production and capitalism cannot survive, in this case because it cannot deal with "extreme supply", even though, as Bastani accepts, today's capitalism is finding ways to circumvent that by controlling and restricting supply through enforcing monopoly rights.

In one of the many absences from the book, the human side of the social relations of production gets little attention, whether in the workplace or society in general. Both the working class and class more generally are absent as agency and struggle. Class struggle also affects not merely the way in which technologies are developed and implemented under capital but also the content of the technologies themselves. We need a means for the democratic assessment of technologies. Instead here we have uncritical technophilia.

His reading of Marx leads Bastani to conclude that the productive forces needed to support "a post-scarcity, post-work" world were in existence only from the late 60s. To attempt socialism before then was impossible: "You could conceive of it… but you could not create it. This was… simply an inevitability of history." But it was well within the economic potential of the mid 20th century to provide sufficient housing, healthcare food and education to create a viable socialism, even if not a post-scarcity utopia. It was quite possible to provide a number of the free services that Bastani advocates as transitional measures to FALC.

For Bastani revolutionary socialists in the 20th century were simply before their time and their failure an inevitability. The Russian Revolution was "an anti-liberal coup" (was Kerensky really a liberal?). The consequence of that reasoning is to airbrush Stalinism as something inevitable and indistinguishable from the revolutionary years of the USSR: "Its [the Soviet Union's] seven decade survival was one of the great political achievements of the last century."

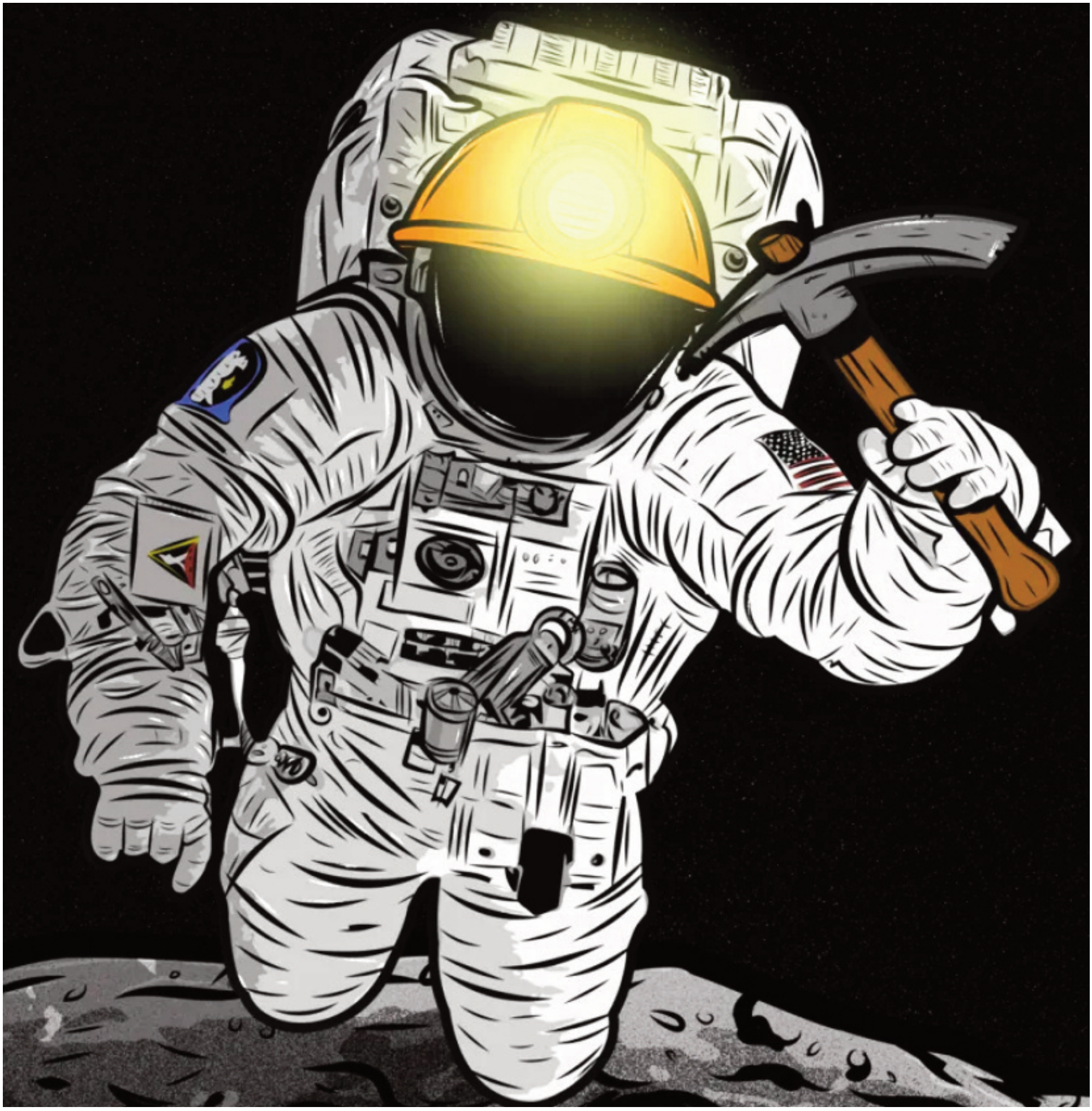
His vision of communism is "a society in which work is eliminated, scarcity replaced by abundance and where labour and leisure blend into one another". He takes up Marx's notion of "free individuality" as the essence of communism, but ignores its grounding in social labour, leaving out the need for collectivity and forms of social solidarity and democratic control that flow from the need to produce. The realm of necessity – the labour of the associated producers — is not abolished, however many robots there are, but rather diminishes relative to free time.

With social labour deleted, Bastani's communism reduces to individualism. Freedom is "self- authorship… Liberal ends… are impossible without communist means." FALC is "the politics of the self-help guru – be precisely who you want to be – embedded within a programme for political change." Looking at "full automation", Bastani argues that, despite the waged working class having grown massively to be the majority on the planet, we have reached "peak labour" and that AI and automation will shrivel the amount of work that needs to be done. Such projections remain speculative.

As Bastani concedes, not all jobs will disappear (he points to health, education, geriatric care and jobs requiring creativity and emotional connection). If social labour continues, then the need continues for decisions about how remaining work is divided up and how a division of labour is put in place that enables needed skills to be developed. Bastani never considers whether full automation is something desirable from the point of view of a socialism that puts humans and the environment first. Should we just assume there is no alternative to the technological path enabled by capitalism? For example, the machine learning techniques on which contemporary AI is based are inherently open to bias, false assumptions and false positives. Do we want to live in a machine-run society? Who decides on how technology develops and is implemented? Technocrats or workers?

If the first part of the book might be considered an exercise in utopian thought, the second brings us back to earth with a crash. Purporting to set out the political and economic road from here to FALC, it aims to provide theoretical ballast for Corbynism. In doing so it embraces various classical reformist aims and methods put in a modern context. The "concrete politics" consist of "a break with neo-liberalism, a shift towards worker-owned production, a state-financed transition to renewable energy and universal services." Bastani's "communist means" are based on "reforging the capitalist state", "demanding that the conscious, intentional planning at the heart of modern capitalism be repurposed to socially useful ends." This rests on "the re-localisation of economies", "socialising finance" and a range of free services that will put much of the economy under public ownership.

Relocalisation is based on the premise that also underlies Bastani's opposition to "globalism": that "locally we can start right away" and "break with neo-liberalism without needing national state power" via "local protectionism" (the Preston model). But, for Bastani, the national state is the best environment for beginning FALC. This approach, like Brexit, is both regressive and utopian in trying to reverse capital's integration and development across local and national boundaries. Of course useful action can be taken at national or even local levels, but to see the local as the source of spreading worker enterprises that will eventually bring us to FALC is an illusion. Even if central and local bankers favour worker-owned enterprises (Bastani believes central bankers should become central planners), they still have to compete with much larger capitalist enterprises. The Preston model does not "scale". As Rosa Luxemburg pointed out in her 1899 reply to Eduard Bernstein's "revisionism" of that era, cooperatives can only survive if protected from the operation of capitalist competition. Rather than being the means to implement new technologies as Bastani argues, small and local firms, even if worker-owned, are less likely to be able to afford and be able to implement the new technology that he sees leading to FALC. Why are they able to deal with "extreme supply" if large capitalist enterprises can't? A big gap remains between the communist model supposedly just around the corner and Bastani's immediate programme, which essentially gives a contemporary gloss to long established



social democratic strategies for improving the capitalist state piecemeal.

Having freed himself from any concept of class, Bastani unashamedly embraces populism. “The people [is] not “a permanent and immutable entity” but has its roots in “certain kinds of assembly, social trait or capacity.” He recognises that there is nothing fundamental here to distinguish this from the populism of the right – it just depends who you think the people are and which traits you choose. The book doesn’t give a clear answer on Bastani’s criteria here. How are the “people” mobilised? Here the Bastani of 2010 who favoured the network organisation of the Internet reappears: “the party form… makes increasingly little sense. The same is true of worker organising, radical or reformist, which are [sic] erroneously premised on the society of work enduring forever.” But a few lines later the Bastani of 2019 counters “The role of the labour movement is to liberate the working class... We must build a workers’ party against work...” Bastani here makes increasingly little sense.

This book is notable for a number of absences. There is no conception of working class self-activity either in bringing FALC about or in managing production under it. There is no conception of democratic control in the workplace, in governance of technology or in society more generally. There is no notion of struggle from below to transform economy or society. Those things are presumably out of date. Instead the book combines a view of a future close by in which technology enables us to forget the collective and focus on self with an immediate platform for Corbynism which repackages some traditional left social democratic policies and ideas about how it might come about. These ideas may become fashionable for a while in the same way as Bastani’s original meme. But, however well- wrapped in the ultra-modernity of new technology in a sort of hipster reformism, they do not offer a road to emancipation from capitalism.

Marx's telescope

By Martin Thomas

The working class is the revolutionary class. It is the gravedigger of capitalism and the architect of socialism. Everyone who has even heard of Karl Marx knows that those were central ideas. But Marx himself, in old age, gave an eager suggestion from a young co-thinker about producing an edition of his collected works the wry response: "They would first have to be written". Marx wrote a lot, but only a fraction of what he planned to write, and that fraction selected by haphazard circumstances as well as by deliberation. Thus, the Communist Manifesto opens with the sentence: "The history of all hitherto existing society is the history of class struggles"; but the one chapter where Marx set out to explain systematically what he meant by "class", chapter 52 of Capital volume 3, is an unfinished fragment of five paragraphs.

Likewise with the revolutionary role of the working class. The idea runs through all his writings, yet nowhere does he clear a space to set down his arguments in textbook form, step by step. In textbook Marxism, therefore, it can be all too easy to divide the perspective into two separate propositions:

1. Capitalism will break down (because of economic contradictions);

2. Someone (probably the working class) will take over and concentrate the means of production into a single hand.

The "someone", in this scheme, needs no prior preparation except to be around, and available as a cohesive force, when capitalism collapses. Stalinism could present itself as "Marxist" by hammering at proposition one, and quietly, under cover of the noisy banging, amend proposition two to "someone, in the name of the working class, will take over..." In recovering the real gist of Marx's thought, evaluating its relevance to capital today, and working out a sound long-term perspective in the 21st century, one of Marx's major but least-known writings is central. That is the Grundrisse, Marx's "Rough Draft" of 1857-8.

The Grundrisse, some 779 pages in the English translation, comprises seven notebooks written by Marx in the winter of 1857-8 in a dash (so he hoped) to get his "Economics" finished. In September 1850 Marx had broken with the majority of the Communist League exiles in London, with these words:
"We tell the workers: If you want to change conditions and make yourselves capable of government, you will have to undergo fifteen, twenty or fifty years of civil war. Now they are told [by the majority]: We must come to power immediately or we might as well go to sleep. The word 'proletariat' has been reduced to a mere phrase, like the word 'people' was by the democrats. To make this phrase a reality one would have to declare the entire petty bourgeois to be proletarians, i.e. de facto represent the petty bourgeoisie and not the proletariat. In place of actual revolutionary development one would have to adopt the revolutionary phrase".

In other words, only by a lengthy development within capitalist society (by civil war, Marx evidently means social war, rather than necessarily military battle), does the working class become the revolutionary working class. To adopt the "revolutionary phrase", that is, to pretend that the working class is always immediately revolutionary, is to fall into a politics of pretences. You end up recommending whatever (petty-bourgeois) oppositional movements are immediately to hand, and glossing them up as proletarian, rather than cleaving to the long-term interests of the working class.

Around the same time Marx wrote: "While this general prosperity lasts, enabling the productive forces of bourgeois society to develop to the full extent possible within the bourgeois system, there can be no question of a real revolution. Such a revolution is only possible at a time when two factors come into conflict: the modern productive forces and the bourgeois forms of production... A new revolution is only possible as a result of a new crisis; but it will come, just as surely as the crisis itself".

In 1857 crisis erupted. Marx feverishly set to work to pull together his long-languishing economic studies. "I am working like mad all night and every night collating my economic studies so that I at least get the outlines clear before the deluge", he wrote to Engels (8 December 1857). By February 1858, he was writing to Ferdinand Lassalle: "I would like to tell you how thing stand with my work on economics. For the last few months I have in fact been working on the final version". Final it wasn't. But by June 1858 Marx had completed a manuscript which covered, in outline, much of the terrain to be covered by the three volumes of Capital and the three volumes of Theories of Surplus Value; and, what interests us most here, a great deal besides.

The writing was spurred on by the idea that revolution was the more-or-less mechanical product of crisis. But Marx must have soon realised that this crisis would not evoke revolution. In fact, the Grundrisse is a big step in Marx's path from the idea that revolution is a product of crisis towards his later view that revolution is brewed up in the whole course of capitalist development itself, rather than primarily in the mechanical blockages and reversals of that development (i.e. crises). More than in any of his other works, in the Grundrisse Marx sometimes lays aside the microscope with which he analyses current economic and political intricacies, and takes up a telescope to look at the very long-term trends of capitalist development.

What does that telescope see as the traits of fully-developed capitalist society? In the first place, the commodification of everything, and extensive privatisation of public utilities. Since Engels in Anti-Dühring (the manuscript of which Marx read and approved), Marxists have seen the concentration and centralisation of capital as moving logically to a "highest stage" of the withering of capitalist competition and the grouping of production in the hands of states or of large private capitalist enterprises more or less monopolising their national markets. And up to the 1970s, things went pretty much that way. Now they are obviously different. Capital continues to "concentrate and centralise", as Marx put it in chapter 25 of Capital. But Marx developed that argument "within a given [national] society". That is more or less how it went until nearly 100 years after his death. To this day, most multinational corporations still have a definite "homeland". But on a world scale their growth comes with an intensification of capitalist competition, and a cutback in the direct economic enterprise of individual states.

In the Grundrisse, Marx, more prescient than perhaps he knew, foreshadowed this development: "All general conditions of production, such as roads, canals, etc... presuppose, in order to be undertaken by capital instead of by the government which represents the community as such, the highest development of production founded on capital. The separation of public works from the state, and their migration into the domain of the works undertaken by capital itself, indicates the degree to which the real community has constituted itself in the form of capital..." [p.531].

"The highest development of capital exists when the general conditions of the process of social production are not paid out of deductions from the social revenue, the state's taxes — where revenue and not capital appears as the labour fund, and where the worker, although he is a free wage worker like any other, nevertheless stands economically in a different relation — but rather out of capital as capital.

"This shows the degree to which capital has subjugated all conditions of social production to itself, on one side; and, on the other side, hence, the extent to which social reproductive wealth has been capitalised, and all needs are satisfied through the exchange form; as well as the extent to which the socially posited needs of the individual, i.e. those which he consumes and feels not as a single individual in society, but communally with others — whose mode of consumption is social by the nature of the thing — are likewise not only consumed but also produced through exchange, individual exchange". [p.532] "The invading socialist society" within capitalist forms is thus not, as Engels suggested, the "planned production" of monopolistic associations of private producers, or directly of the capitalist state, in national frameworks.

What are the subversive elements in this advanced capitalist society viewed through Marx's telescope? Capitalism so advanced rarely has women and men as the direct agents of production. Instead the workers tend, supervise, and maintain a process of production driven by science. "The great historic quality of capital is to create this surplus labour, superfluous labour from the standpoint of mere use value, mere subsistence; and its historic destiny [Bestimmung] is fulfilled as soon as...

"on one side, there has been such a development of needs that surplus labour

above and beyond necessity has itself become a general need arising out of individual needs themselves...

“and, on the other side, when the severe discipline of capital, acting on succeeding generations [Geschlechter], has developed general industriousness as the general property of the new species [Geschlecht]...

“and, finally, when the development of the productive powers of labour, which capital incessantly whips onward with its unlimited mania for wealth, and of the sole conditions in which this mania can be realised, have flourished to the stage where the possession and preservation of general wealth require a lesser labour time of society as a whole, and where the labouring society relates scientifically to the process of its progressive reproduction, its reproduction in a constantly greater abundance; hence... where labour in which a human being does what a thing could do has ceased... Natural necessity in its direct form has disappeared; because a historically created need has taken the place of the natural one. That is why capital is productive; i.e. an essential relation for the development of the social productive forces”. [p.325]

Capitalist wealth depends on the capitalist squeezing more labour out of the worker than the equivalent of what he has paid for the labour-power; on “the theft of alien labour”. As science and technology advance, it becomes plain to all that this squeezing of wealth for a few from the misery of the many can replaced by wealth for all by the achievement of collective control over “the general intellect”. Aspiration to that collective control is built into the development which capital spurs on within the working class itself. For capital cannot develop its productive powers, cannot sell the new products which new powers make possible, without constantly requiring greater general knowledge, and expanding the horizon of needs and wants, among the workers (at the same time as it curtails that knowledge, and frustrates those wants and needs).

Marx describes to us a working class which becomes revolutionary because: “Capital’s ceaseless striving towards the general form of wealth drives labour beyond the limits of its natural paltriness [Naturbedürftigkeit], and thus creates the material elements for the development of the rich individuality...” [p.325] which cannot but collide with the barriers of capital.

In the first text in which he identified the working class as the agency of socialist revolution, his Introduction to the Critique of Hegel’s Philosophy of Right (1844), Marx put it like this:

“Where, then, is the positive possibility of a German emancipation? Answer: In the formulation of a class with radical chains, a class of civil society which is not a class of civil society, an estate which is the dissolution of all estates, a sphere which has a universal character by its universal suffering and claims no particular right because no particular wrong, but wrong generally, is perpetuated against it; which can invoke no historical, but only human, title; which does not stand in any one-sided antithesis to the consequences but in all-round antithesis to the premises of German statehood; a sphere, finally, which cannot emancipate itself without emancipating itself from all other spheres of society and thereby emancipating all other spheres of society, which, in a word, is the complete loss of man and hence can win itself only through the complete re-winning of man. This dissolution of society as a particular estate is the proletariat”.

The working class is able to create a new, more human, society... because it has been dehumanised and brutalised, “is the complete loss of man”. There is nothing but dialectical flourish to explain this postulated transition. (Marx’s German here was “der völlige Verlust des Menschen”, and “Mensch” means “human being” or “person” rather than “man” as distinct from “woman”. However, Marx did often go with the then-almost-universal use of “man” as a term for all human beings).

The exposition takes us no further than the hopeful but puzzled comments by Engels in a letter to Marx of October 1844: “As it is, the workers had already reached the final stage of the old civilisation a few years ago, and the rapid increase in crime, robbery and murder is their way of protesting against the old social organisation. At night the streets are very unsafe, the bourgeoisie is beaten, stabbed and robbed; and, if the proletarians here develop according to the same laws as in England, they will soon realise that this way of protesting as individuals and with violence against the social order is useless, and they will protest, through communism, in their general capacity as human beings. If only one could show these fellows the way! But that’s impossible”.

In the Communist Manifesto (1848), Marx has moved forward. Building on the prefigurations of human solidarity which he has seen in his association with organised French socialist workers in Paris in 1844, and on the understanding of the importance of trade-union struggles which he has developed from studying the English experience and in his polemic against Proudhon (1846), he adduces positive properties of the working class itself — its self-organisation in economic struggles, its building of links using modern communications, its learning about political action thanks to the bourgeoisie being compelled to draw it into that action — rather than simply postulating it as the negation of capitalist society.

He also distinguishes between the working class, as a revolutionary force, and those who are most brutalised and dehumanised by capitalism, the lumpenproletariat, whom he considers more likely to be reactionary. Even in the Communist Manifesto, though, Marx has not emancipated himself from the old “iron law of wages” (the idea, commonplace among socialists at the time, that capitalism necessarily limited wages to physical-subsistence level), and so there are still large elements of his view of the working class as the epitome of brutalisation and dehumanisation. “It is only the most simple, most monotonous, and most easily acquired knack, that is required of him. Hence, the cost of production of a workman is restricted, almost entirely, to the means of subsistence that he requires for maintenance, and for the propagation of his race. But the price of a commodity, and therefore also of labour, is equal to its cost of production. In proportion, therefore, as the repulsiveness of the work increases, the wage decreases....”

In the Grundrisse (and later, in chapter 15 of Capital), Marx argues differently. Developed capitalist production, precisely because of its drive to extract and realise surplus value, has no choice but to “drive labour beyond the limits of its natural paltriness”, to replace “labour in which a human being does what a thing could do”, to create a workforce of varied and wide potentialities, and also to create new aspirations and needs among the working class. “A precondition of production based on capital is therefore the production of a constantly widening sphere of circulation, whether the sphere itself is directly expanded or whether more points within it are created as points of production. While circulation appeared at first as a constant magnitude, it here appears as a moving magnitude, being expanded by production itself... The tendency to create the world market is directly given in the concept of capital itself.... The production of relative surplus value, i.e. production of surplus value based on the increase and development of the productive forces, requires the production of new consumption... creation of new needs by propagating existing ones in a wide circle... production of new needs and discovery and creation of new use values... [Thus] the cultivation of all the qualities of the social human being, production of the same in a form as rich as possible in needs, because rich in qualities and relations — production of this being as the most total and universal possible social product, for, in order to take gratification in a many-sided way, he must be capable of many pleasures [genussfähig], hence cultured to a high degree — is likewise a condition of production founded on capital....

“Just as production founded on capital creates universal industriousness on one side... so does it create on the other side a system of general exploitation of the natural and human qualities... while there appears nothing higher in itself, nothing legitimate for itself, outside this circle of social production and exchange... “Hence the great civilising influence of capital; its production of a stage of society in comparison to which all earlier ones appear as mere local developments of humanity and as nature-idolatry... Capital drives beyond national barriers and prejudices as much as beyond nature worship, as well as all traditional, confined, complacent, encrusted satisfactions of present needs, and reproductions of old ways of life. It is destructive towards all of this, and constantly revolutionises it...” [p.409-10]

Too often among Marxists, this thought has been dismissed as relevant only to “when the bourgeoisie was a progressive class”. We are told that since some time around World War One capitalism has been in its “epoch of decay”, and so all it does is reactionary. At best this argument is a stretching — to breaking point and beyond — of an assessment by Marxists like Lenin and Trotsky of actual capitalist decay in the period after World War One. They worked to have that decay replaced by workers’ power. They were defeated. It was replaced by a self-restructuring of capital, at workers’ expense, which eventually created the terms for a new capitalist expansion. At worst it becomes sheer superstition and romanticisation of the bourgeoisie of days gone by. So the “financial aristocracy” which ruled France at the time Marx wrote the Communist Manifesto, which Marx called “the lumpenproletariat reborn at the pinnacle of bourgeois society”, could work a “civilising influence of capital”? Or the “gang of shady characters” which succeeded it to rule between 1851 and 1870? Or the Gradgrinds and Boundlerbys of mid-19th century Britain? Those who, as Marx put it, had enslaved the workers to no more impressive purpose than “to transform a few vulgar and half-educated upstarts into ‘eminent cotton-spinners’, ‘extensive sausage makers’ and ‘influential blacking dealers’.” They were not so bad? They were “progressive bourgeois”? But the bourgeois of today, who in their own interests and in their own way have set up the Internet and mass higher education? They, in contrast, have provided no elements on which the working class can seize as levers for emancipation?

Marx refers, startlingly but emphatically, to the “civilising influence of capital” on the working class. Read thoroughly, and it is clear that Marx is very far from “the ‘socialist’ professors” whom Rosa Luxemburg derided as: “acclaim[ing] the wearing of neckties, the use of visiting cards, and the riding of bicycles by proletarians

as notable instances of participation in cultural progress".

Whatever the arguments about Hegel, it is clear that Marx's telescope sees development as proceeding through contradictions. Marx is clear that the "positive aspects" of capitalist development are inextricably intertwined with — really, are the same thing as — the "negative aspects". They are the same process looked at from a different angle. And they are "positive" not because they make capitalism not so bad after all, but because they create within capitalism an immense potential for abolishing and going beyond capitalism.

It is precisely the drive to exploit — to extract more and more surplus-labour and then to "realise" it (by selling the products) — that drives the "civilising influence". And the "civilising influence" becomes manifest through the workers' fight back against that drive to extract surplus labour, and the organisation and self-education built on it.

"The semblance of exchange [between workers and capital] vanishes in the course [Prozess] of the mode of production founded on capital. This course itself and its repetition posit what is the case in itself, namely that the worker receives as wages from the capitalist what is only a part of his own labour. This then also enters into the consciousness of the workers as well as of the capitalists". [p.597].

This development-through-contradiction, for Marx, breeds a drive by the working class to press on through the contradictions and to go beyond them by seizing collective control of production. Marx did not attempt to carry this argument through in full detail in Capital. A pungent condensation of it is however there, in passages little-noticed in summaries of Capital but nonetheless central to the book's argument about the revolutionary role of the working class and specifically of the working class in the most advanced capitalist industry.

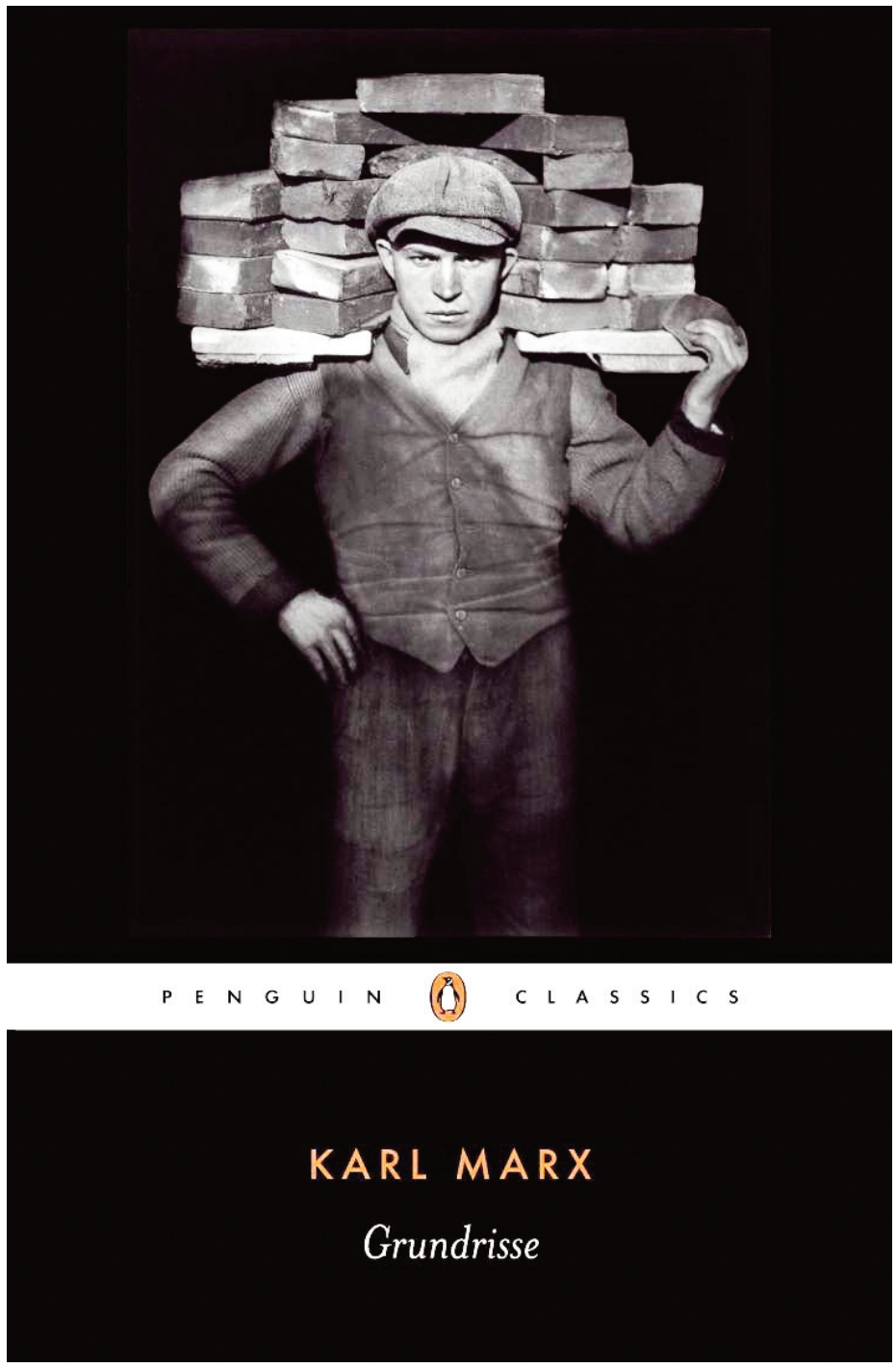
"Modern Industry never looks upon and treats the existing form of a process as final. The technical basis of that industry is therefore revolutionary, while all earlier modes of production were essentially conservative... It is continually causing changes not only in the technical basis of production, but also in the functions of the labourer, and in the social combinations of the labour-process. At the same time, it thereby also revolutionises the division of labour within the society, and incessantly launches masses of capital and of workpeople from one branch of production to another. But if Modern Industry, by its very nature, therefore necessitates variation of labour, fluency of function, universal mobility of the labourer, on the other hand, in its capitalistic form, it reproduces the old division of labour with its ossified particularisations... This absolute contradiction between the technical necessities of Modern Industry, and the social character inherent in its capitalistic form, dispels all fixity and security in the situation of the labourer… Variation of work at present imposes itself after the manner of an overpowering natural law, and with the blindly destructive action of a natural law that meets with resistance at all points, [but] Modern Industry, on the other hand, through its catastrophes imposes the necessity of recognising, as a fundamental law of production, variation of work, consequently fitness of the labourer for varied work, consequently the greatest possible development of his varied aptitudes... By maturing the material conditions, and the combination on a social scale of the processes of production, it matures the contradictions and antagonisms of the capitalist form of production, and thereby provides, along with the elements for the formation of a new society, the forces for exploding the old one" [Chapter 15, section 9]

As a footnote, to give individual illustration to his argument about the subversive potential of advanced industry's inherent fluidity, Marx cites the testimony of a French worker who spent time in California:

"I never could have believed, that I was capable of working at the various occupations I was employed on in California. I was firmly convinced that I was fit for nothing but letter-press printing.... Once in the midst of this world of adventurers, who change their occupation as often as they do their shirt, egad, I did as the others. As mining did not turn out remunerative enough, I left it for the town, where in succession I became typographer, slater, plumber, etc. In consequence of thus finding out that I am fit to any sort of work, I feel less of a mollusk and more of a man".

There is nothing in the Grundrisse about trade-union struggles, organisation, utilisation of the political arenas of bourgeois democracy, i.e. the specific forms through which Marx saw workers collectively becoming "less of molluscs, more of humans", and indeed more than just the dialectical obverse of capital, more than just the poverty accompanying capitalist wealth. For that we need to read The Poverty of Philosophy, Wages Price and Profit, and Marx's writings for the First International.

But there are two things in the Grundrisse, very important for our times, which is not in those better-known articles and pamphlets. Contrary to what became the assumption — reasonable on the face of it — of most Marxists in the era



after Marx's death, Marx here suggests that every building-up of the labour movement, until our final victory, must be only provisional and temporary, subject to be undermined by the constant whirl of capitalist restructuring. The movement will then need to be built up again, with a changed, more developed, more "individualistic" working class..

Marx takes the emergence of "labour in general", as distinct from a segregation of the population into traditional trades and callings, as characteristic of developed capitalist society, and as existing empirically "as its most developed in the most modern form of existence of bourgeois society — the United States". This is not "labour in general" established by the fact that everyone does much the same sort of labour. On the contrary. "Indifference towards any specific kind of labour presupposes a very developed totality of real kinds of labour, of which no single one is any longer predominant" [p.104]. As capital develops, therefore, labour becomes every more differentiated and ever more fluid. Every form of labour organisation built up on fixed communities or trades is, in time, dissolved, the movement has to rebuild itself on the basis of an even richer, more diverse, "totality of real kinds of labour". The response is never automatic; the process is never linear.

According to Marx in the Grundrisse, capital's constant process of expanding human potentialities and simultaneously making human society more "empty" will always generate more than one response. The revolutionary communist response is to push forward, on through the whirl and out the other side, to emancipation. But, Marx insists, the "reactionary anti-capitalist response" will be there too, always, "to the blessed end".

"Universally developed individuals, whose social relations, as their own communal [gemeinschaftlich] relations, are hence also subordinated to their own communal control, are no product of nature, but of history. The degree and the universality of the development of wealth where this individuality becomes possible supposes production on the basis of exchange values as a prior condition, whose univer-

sality produces not only the alienation of the individual from himself and from others, but also the universality and the comprehensiveness of his relations and capacities.

"The degree and the universality of the development of wealth where this individuality becomes possible supposes production on the basis of exchange values as a prior condition, whose universality produces not only the alienation of the individual from himself and from others, but also the universality and the comprehensiveness of his relations and capacities. In earlier stages of development the single individual seems to be developed more fully, because he has not yet worked out his relationships in their fullness, or erected them as independent social powers and relations opposite himself.

"It is as ridiculous to yearn for a return to that original fullness as it is to believe that with this complete emptiness history has come to a standstill. The bourgeois viewpoint has never advanced beyond this antithesis between itself and this romantic viewpoint, and therefore the latter will accompany it as legitimate antithesis up to its blessed end". [p.162] Und darum wird jene als berechtigter Gegensatz sie bis an ihr seliges Ende begleiten.

Marx holds that "the old view" which "appears very lofty" is actually much more limited; that the break-up of pre-capitalist communal relationships is in fact a precondition of emancipation. "The reproduction of presupposed relations... of the individual to his commune, together with a specific, objective existence, predetermined for the individual, of his relations both to the conditions of labour and to his co-workers, fellow tribesmen etc. — are the foundation of development, which is therefore from the outset restricted... Great developments can take place here within a specific sphere. The individuals may appear great. But there can be no conception here of a free and full development either of the individual or of the society, since such development stands in contradiction to the original relation. Do we never find in antiquity an inquiry into which form of landed property etc. is the most productive, creates the greatest wealth? Wealth does not appear as the aim of production, although Cato may well investigate which manner of cultivating a field brings the greatest rewards, and Brutus may even lend out his money at the best rates of interest. The question is always which mode of property creates the best citizens. Wealth appears as an end in itself only among the few commercial peoples — monopolists of the carrying trade — who live in the pores of the ancient world, like the Jews in medieval society...

"Thus the old view, in which the human being appears as the aim of production, regardless of his limited national, religious, political character, seems to be very lofty when contrasted to the modern world, where production appears as the aim of mankind and wealth as the aim of production. In fact, however, when the limited bourgeois form is stripped away, what is wealth other than the universality of individual needs, capacities, pleasures, productive forces etc., created through universal exchange? The full development of human mastery over the forces of nature, those of so-called nature as well as of humanity's own nature? The absolute working-out of his creative potentialities, with no presupposition other than the previous historic development, which makes this totality of development, i.e. the development of all human powers as such the end in itself, not as measured on a predetermined yardstick? Where he does not reproduce himself in one specificity, but produces his totality? Strives not to remain something he has become, but is in the absolute movement of becoming? In bourgeois economics — and in the epoch of production to which it corresponds — this complete working-out of the human content appears as a complete emptying-out, this universal objectification as total alienation, and the tearing-down of all limited, one-sided aims as sacrifice of the human end-in-itself to an entirely external end. This is why the childish world of antiquity appears on one side as loftier..." [p.487-8].

In the Communist Manifesto Marx and Engels started their definition of what was specific to their socialist or communist politics by denouncing "reactionary socialism". Their denunciation of those reactionary anti-capitalists was more absolute than their damning of the bourgeoisie itself. Marx and Engels set their aim as "the Communistic abolition of buying and selling, of the bourgeois conditions of production, and of the bourgeoisie itself". And the way towards that? Ruthless class struggle by the workers against that bourgeoisie. But they also credited the bourgeoisie with installing massive forces of production; opening out communications; creating "a world literature" in place of old "narrow-mindedness"; "supplying the proletariat with its own elements of political and general education" in the battles of bourgeois democracy; and, by prompting the defection of a section of bourgeois intellectuals to the side of the working class, "supplying the proletariat with fresh elements of enlightenment and progress".. For the reactionary socialists — feudal socialists, Christian socialists, "petty-bourgeois socialism" ("corporate guilds for manufacture; patriarchal relations in agriculture"); the "true socialism" of "sickly sentiment" — they saw no such other side of the story.

In the Communist Manifesto, however, those species of "reactionary socialism" are depicted as social and political remnants, about to disappear. Marx and Engels were vehement against what they saw as tendencies in the early German workers' movement to dally with the idea of "socialistic" measures to be achieved in alliance with the landlord class or the state bureaucracy against the bourgeoisie. But in their later writings, on the whole, the idea of a two-front fight against capital and against reactionary anti-capitalist forces tends to fade away.

Something like the old idea can be found in such writings as the pioneer Russian Marxist George Plekhanov's Our Differences, where he warns that if an anti-capitalist revolution through coup d'état by the populists (the dominant radical force in Russia at the time) were possible, it would "lead to a political monster similar to the ancient Chinese or Peruvian empires, i.e. to a renewal of tsarist despotism with a communist lining". On the whole, however, the idea faded away in the Marxism of the era before World War One. The labour movements were getting stronger, and moving towards modern socialist ideas. Aside from what could reasonably be dismissed as freakish episodes, like the proto-fascist agitation of General Boulanger in France in 1887-9, bourgeois society moved slowly but unmistakably towards more bourgeois democracy. No-one imagined such things as fascism and Stalinism.

Actually, all that was a lull. Boulanger was not a freak, but a prefiguration of politics that would dominate much of 20th century history — of reactionary attempts to counterpose an imaginary social "fullness" to the way capital inexorably creates human "emptiness" in bourgeois society. The reactionary anti-capitalist response does indeed accompany bourgeois society "to the blessed end". Contrary to crude interpretations of Marx, and in line with Marx's own predictions in Theories of Surplus Value, the "middle classes" — among sections of whom that reactionary anti-capitalist response can find its first natural base (though from there it can spread, and has sometimes spread, to large working-class audiences) — remain large even in the most advanced capitalism.

The "reactionary anti-capitalist" response can be "modernised". In the Grundrisse, Marx dissected such a "modernised" response in the writings of the American economist Henry Carey, contrasting him with the French writer Frederic Bastiat. Bastiat was a neo-liberal before his time. His response to the French socialists was that all the defects they complained of in French society were simply due to the capital not being fully enough developed in France. "The task is to free bourgeois society from the fetters which the state imposes on it. You want to multiply those fetters. First work out the bourgeois relations in their pure form, and then we may talk again". Marx, of course, had no time for Bastiat, and reckoned that as against Bastiat, Carey was "rich in, so to speak, bona fide research in economic science". But Carey had the characteristic "reactionary anti-capitalist" trait of counterposing an idealised version of supposedly more harmonious earlier development to the stresses and contradictions of contemporary capitalism.

Carey was by no means an "absolute anti-capitalist". Nor in fact are most "reactionary anti-capitalists". Paradoxically, among the reactionary anti-capitalists, the most reactionary are the most anti-capitalist, those who are most absolute in their anti-capitalism. If the artificial harmonious ideal which they counterpose to the capitalist whirl of today is thoroughly non-capitalist, then it has to presuppose the crushing into invisibility of that characteristic product of capitalist society, the working class. There are plenty of milder "reactionary anti-capitalists".

Carey was Abraham Lincoln's chief economic adviser. He argued that capitalist development could be harmonious in the USA — if only it shut out the disturbing influence of more developed English capital. "With Carey the harmony of the bourgeois relations of production ends with the most complete disharmony of these relations on the grandest terrain where they appear, the world market, and in their grandest development, as the relations of producing nations. All the relations which appear harmonious to him within specific national boundaries or, in addition, in the abstract form of general relations of bourgeois society -- e.g. concentration of capital, division of labour, wage labour etc. -- appear as disharmonious to him where they appear in their most developed form -- in their world market form -- as the internal relations which produce English domination on the world market, and which, as destructive influences, are the consequence of this domination.

"If patriarchal gives way to industrial production within a country, this is harmonious, and the process of dissolution which accompanies this development is conceived in its positive aspect alone. But it becomes disharmonious when large-scale English industry dissolves the patriarchal or petty-bourgeois or other lower stages of production in a foreign country. The concentration of capital within a country and the dissolving effect of this concentration present nothing but positive sides to him. But the monopoly of concentrated English capital and its dissolving effect on the smaller national capitals of other countries is disharmonious.

"What Carey has not grasped is that these world-market disharmonies are merely the ultimate adequate expressions of the disharmonies which have become fixed as abstract relations within the economic categories or which have a local exis-

tence on the smallest scale. No wonder, then, that he in turn forgets the positive content of these processes of dissolution... when he comes to their full appearance, the world market. Hence, where the economic relations confront him in their truth, i.e. in their universal reality, his principled optimism turns into a denunciatory, irritated pessimism".

Referring to the maverick English writer David Urquhart, who was a "conspiracy theorist" seeing the intervention of Tsarist Russia as responsible for the world's every evil, Marx wrote: "What Russia is, politically, for Urquhart, England is, economically, for Carey..." And so today, the USA is, politically and economically, for the "Yankophobe" left.

Stalinism was the 20th century's dominant form of "reactionary anti-capitalism", and the one that set the terms for today's "Yankophobe" left. Today many leftists whose minds are dominated by the left-overs of Stalinism (though they sincerely reckon themselves anti-Stalinist) have their politics shaped by the desire to see in political Islam a "filler" for the "revolutionary phrase" they adopt in place of "actual revolutionary development". Or, in a simpler form of "reactionary anti-capitalism", they lapse into looking for "liberated spaces" and "counter-powers" in little communities, as if those little communities could prevail against what Marx identified as "the real community" in bourgeois society, namely capital. One way or another, though, we will have to fight reactionary anti-capitalism "to the blessed end".

The Grundrisse steers us away from the increasingly-desperate "crude-Marxist" idea that revolutionary working-class consciousness can come only from the economic dissatisfaction consequent upon economic crisis, but at least (in return) is pretty certain to come, Pavlov-dog fashion, in response to that crisis. It points us instead to the task of constantly rebuilding and re-educating the labour movement within the processes of capitalist development. It orients us to a fight on two fronts against capital and against reactionary anti-capitalism.

It also raises at least two big questions requiring new thought by Marxists in the light of today's conditions. First, consumerism. Marx is unambiguous about seeing capitalist consumerism as a constructive force, widening workers' horizons, expanding their needs. Can that still be true today? Isn't the desire for the new computer games console, the four-wheel drive, and the monster fridge-freezer, on the contrary, a stultifying factor? Isn't there a natural limit? Research by economists, tricky by the very nature of the subject but still impressive in the accumulation of similar results from diverse investigations, suggests that people are happier with more possessions only up to a certain point. Above quite a low level, people are made unhappy by inequality more than by low absolute level of income; so, for sure, someone living in Britain today on an average wage from the 1950s would be unhappy because relatively poor. And it does not follow that the most modern gadgets are of the least human value; plenty of people might prefer to do without that relatively "old" invention, the car, rather than, say, a computer or a mobile phone. But, somewhere about the level reached by averagely well-off workers in better-off countries between the 1950s and the 1970s, there is a cut-off. Up to that point, more "stuff" pretty much uniformly makes people happier; after that, not.

In fact, doesn't there have to be a limit of some sort for the Marxist perspective of a communism of "general abundance" to be possible? If when everyone has all the basics, people are still trying to elbow each other into the gutter to get shinier or newer stuff, and need to be policed either by the market or (probably more harmfully) by a "gendarme on the BMW queue", then we may be able to create a somewhat more humane and equal society, but we can never reach anything like what Marx foresaw as communism. In any case, nature imposes limits. If everyone in the world wanted to live in the style of the middle class in California, they could not. The drain on, and the damage to, the resources of the planet would be unsustainable. In that situation, doesn't capitalist consumerism become a retrogressive factor, a factor making the working class less and not more subversive?

There is force to these arguments. But they can mislead the left into a hopeless dead-end, indeed another variant of reactionary anti-capitalism. Our polemical edge has to be directed against the hypertrophy of capitalist advertising and the relentless search for the easy quick buck in capitalist cultural production, not against the workers who like MTV or take too many cheap flights. A relatively harmless, but comic, example of the snares is an article from 1986 by Ernest Mandel, attempting to answer a critic who said that the Marxist vision was impossible because, however prosperous, people would always want more stuff.

Mandel had to suggest that there were some consumer goods which people would really not mind doing without. Casting around for an example, he picked on the video cassette recorder, then an expensive new luxury. "Might it not be preferable to forego the Betamax [i.e. VCR]... and to work ten hours fewer a week, with much less stress — if the satisfaction of all primary needs were not endangered by such a reduction?" (New Left Review I/159, September-October 1986).

Now almost all working-class people in prosperous countries have, not VCRs, but more advanced technologies (DVD players, Netflix, etc.) of the same sort. In Kabul under the Taliban, in the 1990s, one of the things that people would risk terrible reprisals for was to gather in cellars and watch videotapes of the film Titanic on VCRs and TVs carefully hidden from the religious police. It would not go down well to tell the working class, even in poorer countries, that communism will be good, but Netflix and DVD players will be unavailable.

A bigger example is the whole history of twentieth-century housing. Shuffle off much of the blame though we can onto capitalist governments like the British Tories of 1950s and 1960s who implemented programmes on the cheap and with the profits of the building contractors mainly in mind, the template for mass worker housing in the 20th century was set, and calamitously so, by thinkers of the left. No, they believed, workers were not consumerist. They would not want suburban villas like the middle class. They would want sparely-designed, "functional", compulsorily-communal, and (supposedly) economical housing in huge blocks of flats. The debacle of this vision has enabled writers of the right (Tom Wolfe in From Bauhaus To Our House, and Alice Coleman in Utopia On Trial) and of the centre (Jane Jacobs in The Death and Life of Great American Cities and elsewhere) to throw real discredit on the left. It also helped lay the basis for the sell-off of council houses to become Thatcher's most popular policy, and to be followed under Blair by a government drive to abolish council housing altogether.

Let us consider what Marx meant when he praised capitalist consumerism. The worker "becomes co-participant in general wealth up to the limit of his equivalent — a quantitative limit which, of course, turns into a qualitative one, as in every exchange. But he is neither bound to particular objects, nor to a particular manner of satisfaction. The sphere of his consumption is not qualitatively restricted, only quantitatively. This distinguishes him from the slave, serf etc... [This] gives [workers] as consumers... an entirely different importance as agents of production from that which they possessed e.g. in antiquity or in the Middle Ages, or now possess in Asia". [p.283]. "Moreover, the semblance [of equality in the exchange] exists, nevertheless, as an illusion on his [the worker's] part and to a certain degree on the other side, and thus essentially modifies his relation by comparison to that of workers in other social modes of production". [p.284].

Capitalists demand that their workers scrimp and save. But this can be done effectively only by exceptional individual workers. If the working class as a whole were to follow the advice of the bourgeois preachers of thrift, it would lead to "brutalisation", the level of wage labour where "the most animal minimum of needs and subsistence appears to [the worker] as the sole object and purpose of his exchange with capital" [p.285].

"The worker's participation in the higher, even cultural satisfactions, the agitation for his own interests, newspaper subscriptions, attending lectures, educating his children, developing his taste etc., his only share of civilisation which distinguishes him from the slave, is economically only possible by widening the sphere of his pleasures at the times when business is good, where saving is to a certain degree possible… Moreover, the capitalist simultaneously encourages other workers (not his own employees) to consume, to spend. In spite of all 'pious' speeches he therefore searches for means to spur them on to consumption, to give his wares new charms, to inspire them with new needs by constant chatter etc. It is precisely this side of the relation of capital and labour which is an essential civilising moment, and on which the historic justification, but also the contemporary power of capital rests". [p.287]

Marx would have known very well that the workers who used all their little discretionary income to read newspapers and books, attend lectures and political or trade-union meetings, visit art galleries, and so on were the minority. So even were those who used it for other "cultural" activities such as the more varied forms of religious service newly available, or sports. The typical new goods of mass consumption at the time were tea, spirits, opium, sugar, processed foods, and mass entertainment of a sort which the worst efforts of modern commercial TV would find it hard to match for coarseness and degradation. Public executions were still a major form of mass entertainment in England until they were ended as late as 1868. The newer forms of mass entertainment, available in the most prosperous countries, were epitomised by P T Barnum.

Barnum began his career as a showman in 1835 with his purchase and exhibition of a blind and almost completely paralysed African-American slave woman, Joice Heth, claimed by Barnum to have been the nurse of George Washington, and to be over a hundred and sixty years old. He then ran a museum in New York, where he made a special hit in 1842 with the exhibition of Charles Stratton, the celebrated midget "General Tom Thumb" and the Fiji Mermaid. His collection also included the original Siamese twins, Chang and Eng Bunker. After a temporary retirement, and a couple of failures, he opened his last enterprise in 1871 — P T Barnum's Grand Traveling Museum, Menagerie, Caravan & Hippodrome, a travelling amalgamation of circus, menagerie and museum of "freaks".

Marx knew that capitalism intertwines its expansion of culture with an inculcation of "stupidity", which includes driving us towards trying to satisfy all needs with ever-more private possessions. "Private property has made us so stupid and one-sided that an object is only ours when we have it — when it exists for us as capital, or when it is directly possessed, eaten, drunk, worn, inhabited, etc., — in short, when it is used by us". [1844 Manuscripts, section on "Private Property and Communism"]. Simultaneously with the "civilising influence", inculcation of stupidity; simultaneously with inculcation of stupidity, capitalism's creation of a system of "artificial" needs, i.e. of culture, with great subversive and creative potential. The emancipation of culture from that "stupidity" can come only through human activity pushing through and beyond capitalist consumerism, not by an attempt to back out of it into an earlier, simpler era.

"Crude communism... how little this annulment of private property is really an appropriation is in fact proved by the abstract negation of the entire world of culture and civilisation, the regression to the unnatural simplicity of the poor and crude man who has few needs and who has not only failed to go beyond private property, but has not yet even reached it. The community is only a community of labour, and equality of wages paid out by communal capital — by the community as the universal capitalist. Both sides of the relationship are raised to an imagined universality — labour as the category in which every person is placed, and capital as the acknowledged universality and power of the community". [1844 MS, ibid].

Part of the answer to the dilemmas around consumerism may lie in discussion of another big issue: education. One of the driving forces behind the pathological features of capitalist consumerism is, after all, a hopeless race to fill the "emptiness" which Marx identified as endemic to bourgeois society. Really to fill that "emptiness" requires the recreation of human solidarity in place of the atomisation and competitiveness of bourgeois society; and, unless that is to be an enterprise in regression towards the stultifying, horizon-narrowing, conformist communities of all pre-capitalist class societies, a vast expansion of education and culture.

In the Grundrisse, Marx writes sweepingly of "the general intellect". But who is "the general"? It is not the bourgeoisie. One of the things most manifest in our times, when eminent capitalists move from the top of one company to the top of another with lavish "golden hellos" and "golden farewells" but no-one suggesting that they need know anything about the different technologies employed in the different industries, is that capitalist success is essentially measured by the ability to do down workers and other capitalists, not by intellect. The "engineer, technologist, etc." is, as Marx put it in Capital, "a limb of the aggregate worker at a greater distance from the actual manual labour".

But also, often, from the mass of the workers. If Marx is right about the "general intellect" becoming a greater and greater productive force, then working-class emancipation involves the collective ownership not only of the physical machinery of production but also of "the general intellect". And this is more than just the breaking-down of the walls of commercial secrecy, patent, copyright, and commercial sponsorship of research which keep knowledge parcellised today.

Exactly what it means positively is not clear. Sometimes Marx seems to think in terms of a future society where everyone will have at least a sound acquaintance with every field of knowledge. That might just have been possible in the mid 19th century, for a prodigy of industriousness, curiosity, and mental retentiveness such as Engels. Science has expanded too far for it to be possible today. Even the most able and hardest-working person today, faced as Engels was with writing articles at speed on random topics for the New American Cyclopedia, would find herself or himself utterly, catastrophically ignorant on many of the items. But an education for every person sufficient for them to orient themselves in the main areas of social life and of science? That might be possible. Indeed, it is necessary if in future human society is going to be able to make the decisions it needs to make about regulating its relations with its natural environment in a really rational and democratic way.

We are lamentably far from it today. The drive of capital for "the fitness of the worker for the maximum number of different kinds of labour" has made education into by far the biggest industry — measured by number of "workers", studying, teaching, or ancillary — in many capitalist countries. Sixteen years or so of full-time education, followed by extensive part-time learning, is not uncommon now, and in sheer quantity of time it should be sufficient to ensure a democratic participation in "the general intellect".

In practice, far from it. The generic inhospitability of capitalist society to such a democratic enterprise as general all-round education; the demoralisation generated by long-term unemployment or semi-employment; the mental damage of the insecurities and inequalities of life under neo-liberalism; the "shouting-down" of education by the louder voices of commercial TV and other media; and, paradoxically perhaps, the artificial separation of education from productive work carried out by adults (student-workers mostly being confined in industries which

employ almost exclusively young workers) — all combine to make modern education systems tremendously inefficient. A 1996 survey in Britain by the Office for National Statistics found that 39% of males and 52% of females aged between 16 and 24 (and a higher proportion of older people) had a lower level of literacy and numeracy than "the minimum level required to cope with modern life and work" on OECD reckonings. This was not a matter of reading James Joyce or understanding quantum physics, but of the ability to "locate and use information in graphs, timetables and charts..."

The ideologists of capital have few answers to this other than to demand "more testing", "a return to traditional methods", and tougher command by "superheads". The left must cease to consider education as a marginal sector of society, to be attended to chiefly when teachers campaign for higher wages, students protest at higher fees, or schools complain of reduced budgets. We need a more revolutionary programme than higher wages for teachers, zero fees for students, and bigger budgets for schools.

Our work, as socialists, cannot be just to react against particular capitalist policies, or even against capitalism itself. "As the system of bourgeois economy has developed for us by degrees, so too its negation, which its ultimate result", writes Marx. And he expounds this revolutionary "negation", which is not merely a "negation" but also an "ultimate result", as the expansion above all of cultured, educated, social human free time.

"The saving of labour time [is] equal to an increase of free time, i.e. time for the full development of the individual, which in turn reacts back upon the productive power of labour as itself the greatest productive power. From the standpoint of the direct production process it can be regarded as the production of fixed capital, this fixed capital being man himself. It goes without saying, by the way, that direct labour time itself cannot remain in the abstract antithesis to free time in which it appears from the perspective of bourgeois economy.

"Labour cannot become play, as [the utopian socialist] Fourier would like, although it remains his great contribution to have expressed the suspension not of distribution, but of the mode of production itself, in a higher form, as the ultimate object. Free time — which is both idle time and time for higher activity — has naturally transformed its possessor into a different subject, and he then enters into the direct production process as this different subject.

"This process is then both discipline, as regards the human being in the process of becoming; and, at the same time, practice [Ausübung], experimental science, materially creative and objectifying science, as regards the human being who has become, in whose head exists the accumulated knowledge of society..." [p.711-2]

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