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# Technology is capital

*Fifth Estate's* critique of the megamachine

Steve Millett

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2004

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will surely be made, but the important point is to *keep* doing what we think enhances community, solidarity, the nurturance of life – to endure. (Watson, 1999: 20)

## Introduction

‘How do we begin to discuss something as immense as technology?’, writes T. Fulano at the beginning of his essay ‘Against the megamachine’ (1981a: 4). Indeed, the degree to which the technological apparatus penetrates all elements of contemporary society does make such an undertaking a daunting one. Nevertheless, it is an undertaking that the US journal and collective *Fifth Estate* has attempted. In so doing, it has developed arguably the most sophisticated and challenging anarchist approach to technology currently available.<sup>1</sup>

Starting from the late 1970s, the *Fifth Estate* (hereafter *FE*) began to put forward the argument that the technologies of capitalism cannot be separated from the socioeconomic system itself. Inspired and influenced by a number of writers, including Karl Marx, Jacques Ellul and Jacques Camatte, it began to conceptualise modern technology as constituting a system of domination itself, one which interlinks and interacts with the economic processes of capitalism to create a new social form, a ‘megamachine’ which integrates not only capitalism and technology, but also State, bureaucracy and military. For the *FE*, technology and capital, although not identical, are more similar than different, and cannot be separated into an ‘evil’ capitalism and an essentially neutral technology. Any critique of capital-

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<sup>1</sup> Although only the work of the *Fifth Estate* collective is considered here (much of which was written by David Watson), there were other crucial elements in the development of these views. Two collaborators and contributors of particular significance were Fredy Perlman and John Zerzan, both of whom had pieces published in the paper (see Perlman, 1983; 1992; Zerzan, 1988). The *Fifth Estate* is a newspaper produced by a group of friends organised into a publishing collective. As such there is no ‘party line’ or ideological view to be adhered to. Equally, there is no ‘Fifth Estate’ group outside of the collective that publishes the paper (although individuals, particularly David Watson, have published elsewhere). Because of this, the paper and collective will be treated as synonymous and the italicised *Fifth Estate* (*FE*) will be used to refer to both.

ism and the State must recognise the importance of contemporary technology and the crucial role it plays in the development of new forms of domination, oppression and exploitation. Concepts of 'capital' and 'megamachine' are also explored later in this chapter.

## *The Fifth Estate*

The *FE* began in Detroit in 1965, started by seventeen-year-old high-school student Harvey Ovshinsky. Set-up with the help of a \$300 loan from Ovshinsky's father, over the course of the next five years it grew to become a focus for Detroit's burgeoning radical and countercultural milieu.

As the anti-war, civil rights, hippie, New Left and alternative culture movements grew in Detroit, so did the paper. Our pages became the forum for the new and rebellious ideas that characterized the era . . . The early paper's content was a mix of articles about psychedelic drugs, the anti-war movement, rock and roll, the alternative culture, and anything that was anti-authority. (Werbe, 1996: 1)

At one point, having a weekly circulation of over 15,000, the *FE* was an integral part of the increasingly confrontational political scene of the late 1960s and early 1970s. Despite, or perhaps because of its high circulation, the paper struggled to maintain production. The sheer workload and the pressure on staff, many of whom did not take a holiday from political work for years, was beginning to take its toll. Worse, the indications were that the political climate in the US was changing. The landslide re-election of Nixon in 1973 signalled the increasing conservatism of the electorate, and the ending of the draft removed one of the main motivating forces behind the popular radicalism of the 1960s.

above, they have not subsequently been given any greater insight into how to effect fundamental and wide-ranging change than anyone else. David Watson points out that: 'our critical perspectives on civilization and technology, like our philosophical and ethical orientation in general, give us no qualitatively special insight into how to transform or dismantle mass society' (Watson, 1996: 18). They do not have a 'special insight', and do not wish to be considered to have one: 'We're a group of friends putting out this paper, not a political group or organizing center, or "voice" of anyone other than ourselves and don't want to be' (Maple, 1983: 2). Certainly, they themselves have been unable to resist the technological juggernaut, producing the paper on a computer since 1993, when their old manual equipment had become unservicable. Their feelings about this were made clear by the heading to the article explaining this conversion: 'The Fifth Estate enters the 20th century. We get a computer and hate it!' (Maple, 1993: 6-7).

Whether or not the *FE*'s refusal to attempt to provide concrete solutions is seen as some sort of 'cop-out', it certainly means that they keep within their own limitations, and avoid grandiosity or the temptation to lay down a proto-ideology. Those who wish to develop this critique further are left with their own problems, ambiguities and opinions. Here Watson and the *FE* find themselves in agreement with the 'technicians', although for different reasons: it is clear there are no 'easy answers':

So, what to do? I'm glad I'm no political organization with a need to invent a nuts-and-bolts plan for everything from what to do with toxic waste to the health care system to a green party program . . . [M]uch of the transformation is already going on around us, within us. People in wide-ranging projects are already answering the question, 'what to do'. I wouldn't presume to tell them. Mistakes

category, not amenable to a simple definition, and the major part of Marx's writings was devoted to exploring its ramifications' (Bottomore, 1991: 68). Clearly, the *FE* does not mean exactly what Marx means by the term, that capital relates entirely to the economic order. Rather, it appears to follow Camatte's extension of capital to imply a culture or civilisation, a material human community. In this vein, and emphasising the cultural aspect, Watson has suggested that, 'capitalism isn't simply an "economic system" – though that is how it names itself. It is a disorder of the Spirit', while elsewhere, writing as George Bradford, he has referred to 'capital' and 'technology' as being 'metaphors, partial descriptions which represent the modern organization of life'. A fuller examination of capital, its characteristics and development in the modern world, and its manifestation as a cultural rather than an economic form – as 'a culture and a way of being' – would be useful here (see Watson, 1992: 1; Bradford, 1984a: 11 and Watson, 1995: 111).

One criticism that could be levelled at the *FE* is that it concentrates almost entirely on critique, and does not attempt to outline either how any change might come about, or what tools or technologies might be useful or necessary in a nontechnological society. In answer to this, the *FE* uses two arguments. The first, already noted, is intrinsic to its critique: programmes and plans are a part of the system it is attacking, and the essence of overthrowing technological society, as a form of consciousness, is to relegate technological matters to second place behind social organisation. Focusing on technological prerequisites is therefore still thinking in a technological way. The *FE* argues that what is important is the social form, and that what technologies will be used are dependent on that, not *vice versa*.

The second argument, which is related to the first, is that simply because the members of the *FE* editorial group have read Marx, Ellul, Camatte and others, and filtered them through their own life-experiences to come to the conclusions outlined

Many people left the *FE*, and it was soon on the verge of collapsing. It survived by taking on a militant socialist/labour perspective, and later by becoming a bi-weekly alternative arts and political publication. By 1975, the paper was in debt to printers and suppliers, it had lost some of its staff through personality clashes and it was now dependent on revenue from commercial advertising. Faced with impending collapse, the remaining staff members put an advert in the paper stating that without new members the paper would close. Peter Werbe, who had worked at the *FE* previously, was one of those who decided to join the paper.

A number of us, including several other former staffers and friends . . . answered the call. Eleven of us had constituted ourselves as the Eat the Rich Gang and undertook a number of projects in 1974–75, including . . . producing a number of *Fifth Estate* inserts, setting up study groups, as well as some sabotage activity and radical pranks. (Werbe, 1996: 5)

These eleven new members effectively carried out a coup which involved a dramatic series of changes in the running of the paper, and led to the resignation of the three existing staffers. These changes included the paper becoming monthly, no longer accepting advertising, and abolishing all paid positions (the new members arguing, 'We will no longer relate to people in this way' (Hippler, 1993: 35)).<sup>2</sup>

The new staff had diverse political outlooks and influences, but it was decided that 'the politics of the paper would reflect a "libertarian communist" viewpoint' (*Fifth Estate*, 1979a: 15). Through the late 1970s and early 1980s, the *FE* staff began to expand and develop their political perspective, based on their

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<sup>2</sup> For another insight into the *FE* and Detroit radical milieu at this time see Perlman, 1989.

own lived experience, on an analysis of relevant events elsewhere and through the study of any texts that seemed to throw light on developments of State and capital in the late twentieth century.

One element that defined the new radical *FE* from early on was its rejection of ideologies, arguing that ‘all isms are wasms’. Ideologies were abstract systems that ended up telling people what they could or could not do or think, and tended to become ossified and not receptive to changing historical conditions. Consequently the *FE* rejected anarchism, but not anarchy as a goal. As it stated in ‘Renew the earthly paradise’ in 1986: ‘We are not anarchists *per se* but rather pro-anarchy, which is for us a living, integral experience, incommensurate with Power and refusing all ideology’ (*Fifth Estate*, 1986: 10). As their perspective developed, *FE* staff came to criticise not only the State and capital but also technology and the entire edifice of industrial civilisation. Their influences were diverse, and in developing the position on technology outlined below they drew on a variety of sources, from the fields of social science, philosophy, politics and anthropology. In order to contextualise their position, as well as suggesting its origins and outlining its trajectory, I will first offer an overview of three writers whose works (even when much was rejected) were central to the emerging *FE* position: Karl Marx, and two French writers, the theologian and social critic Jacques Ellul, and the ultra-Leftist theoretician Jacques Camatte.<sup>3</sup>

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<sup>3</sup> There were many writers and thinkers influential on the *FE*; the three noted here were most significant for the critique of technology. Other important works were Giedion, 1969; Winner, 1977; Mumford, 1969, 1971; Illich, 1990.

lives at a rate greater than before. Secondly, the breadth of the *FE* critique, indicting a system of social relations rather than individual technologies, makes it applicable to conditions and circumstances beyond those originally explored by the *FE*.

Ellul conceives of *technique* as a civilisation that must, by nature and necessity, extinguish other cultures and civilisations with which it comes into contact. Consequently, ‘globalisation’ implies not only the spread of capitalism, but also of technology. Watson (citing Ellul) states that exporting technology is not really about exporting machines: it is about exporting ‘the ensemble of the technological world’ (Watson, 1999: 111). Referring to a photograph of a traditionally dressed New Guinea tribesman with a modern camera, Watson comments: ‘What is he becoming, if not another cloned copy of what we are all becoming?’ (111, 131).<sup>14</sup>

There are terminological problems and ambiguities relating to capital, *technique*/technology, and the relationship between the two. Although the overall link between technology and capital as advocated in the *FE* is clear enough, the exact relationship between the two is less obvious. One of the problems is that it is not entirely clear what the *FE* mean by capital. Despite the centrality of the concept to his work, even Marx does not provide a straightforward definition: ‘Capital is . . . a complex

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<sup>14</sup> Technologies always have an effect on the societies into which they are introduced. The *FE* uses the example of the snowmobiles introduced into Finland in the early 1960s, which resulted in enormous changes in the way reindeer were herded. The traditional methods were soon superseded by quicker methods, and non-mechanised herders were forced to buy snowmobiles to maintain economic parity. But the disruption caused by the new methods disrupted the natural rhythms of the herds to such an extent that fertility and population fell dramatically. Economically, the herders are largely no better off than before the introduction of the snowmobiles, but once introduced, the new speed of activity forces all the herders to buy snowmobiles and increase their own rate of activity, whether they want to or not (St Jacques, 1981). For critiques of the implementation of modern technologies in ‘developing’ countries, see Taghi Farver and Milton, 1972; Shiva, 1991.



## Conclusion

The *FE* has attempted to disentangle capital and technology, and to create the basis for an analysis of technology as an autonomous social agent. Basing its theoretical position on Marx, Ellul and Camatte, it has created a theoretical amalgam which explores the crucial role played by technology in the breakdown of community and the ascendancy of capitalism, and the way it links with capital in an over-arching system of domination. It stresses the inherently authoritarian elements of such technology, and in so doing warns of the dangers of importing it into any future anarchist society.

However, there are obvious problems with the *FE* critique. It is underdeveloped, and has not been systematically explored. In fact, much of the work has been in reply to critical responses to the paper. It also offers no obvious path to change. Additionally, the relationship between capital and technology may be more complex than the *FE* suggests. There is only a small amount of evidence presented to support its claims, in line with the polemical and propagandist nature of the work. It does, however, refer to several other writers, such as Ellul, Weizenbaum and Winner, who can be approached to support its arguments. Further, this work was developed in the 1970s and 1980s, and is based on ideas that were formulated in the 1960s and 1970s. It does not, therefore, consider more recent debates regarding technology, but is primarily involved with opposing Marxist and syndicalist arguments that argue for the neutrality of technology and its continuing relevance to the revolutionary project. There seems no reason to believe, though, that this necessarily undermines any validity its argument might have, since the trajectory of techno-capitalism does not appear to be greatly different in the twenty-first century than in the late-twentieth; certainly, the increasing ubiquity and expansion of electronic information and communication systems is encouraging the penetration of the realm of technology into people's

## Marx – capital and technology

Many *FE* members were aware of Marx's ideas and retained some central elements of his outlook while rejecting much that was seen to be irrelevant or incorrect. One aspect that was retained was the significance of social relations in identifying forms of power and oppression, as Marx did with capital.

In conventional terminology, capital is simply 'an asset owned by an individual as wealth' and could be money, machinery or property (Bottomore, 1991: 68). As such it is ahistorical, and could exist in any society at any time; it is capital by virtue of its intrinsic properties. Marx argued instead that 'capital is not a thing at all, but a social relation which appears in the form of a thing' (*Capital III* cited in Bottomore, 1991: 68). By social relation – or more specifically, social relation of production – Marx meant 'the way people organise in order to produce'. While this organisation could be relatively informal, in the capitalist system the most important relation is the bourgeoisie's ownership of the means of production (leaving the proletariat with only its labour to sell). It is this relation that allows capital to produce wealth, and that is something that is historically specific. For Marx, what defined a particular historical epoch was a combination of the forces or means of production – that is, machinery, plus the available labour power – and these social relations. Together these constitute the 'mode of production'.

Marx focused on production as the key element of human existence, and insisted that it was central to determining the consciousness of individuals:

The mode of production of material life determines the general character of the social, political and spiritual process of life. It is not the consciousness of men that determines their being, but, on the other hand, their social being determines their

consciousness. (Preface to 'A contribution to the critique of political economy', in Bottomore and Rubel, 1963: 67)

He argued that the mode of production 'should not be regarded simply as the reproduction of the physical existence of individuals. It is already a definite form of activity of these individuals, a definite way of expressing their life, a definite *mode of life*' (*German ideology*, in Bottomore and Rubel, 1963: 69). For Marx, you are what, and how, you produce.

Since Marx focused on the relations of production, he did not consider that the machinery had to be examined in and of itself, outside of the relations of production. In *Wage labour and capital* he wrote:

The cotton-spinning machine is a machine for spinning cotton. Only under certain conditions does it become *capital*. Torn away from these conditions, it is as little capital as *gold* by itself is *money*, or as sugar is the *price* of sugar ('Wage labour and capital' in Bottomore and Rubel, 1963: 155)

Because the central determining factor was the social relations, the technology itself could be looked on as effectively neutral. As such it could be a significant element in the revolutionary process and in turn vital to any future communist society. Marx saw communist society emerging as a historical necessity out of the contradictions of capitalism. Technology would play a key role, since it had within it the potential to free humans from the problems of scarcity and usher in a realm of freedom:

Marx anticipates that technology will play a central and essential role in the communist society. In a highly efficient manner it will provide the

creation of a wider culture of resistance to challenge global techno-capitalism. Class struggle as such does not offer the possibility of radical change, since the proletariat has now been absorbed by capital, and is frequently in the front line of the battle to preserve industrial capitalism. As Camatte argues, following the trajectory of capital leads eventually to either slavery or annihilation. In the end, resistance is the necessity of all humanity, not simply the province of a particular group or class:

We are all slaves of capital. Liberation begins with the refusal to perceive oneself in terms of the categories of capital, namely as proletarian, as member of the new middle class, as capitalist, etc. Thus we also stop perceiving the other . . . in terms of those same categories. At this point the movement of recognition of human beings can begin. (Camatte, 1975: 40)

The first step of any change is to begin to formulate a radical critique of the entire global system of oppression, including modern technology, and challenge its basic assumptions:

asking the kinds of questions and raising the kinds of issues that make no sense either to business-as-usual or to palliative reform . . . We have to talk tentatively about how an unprecedented, megatechnic empire and its corresponding constellation of cultures might become an organic weave of diverse, egalitarian, communal societies; and how an atomized, mass human being might become a whole person embedded in a community. (Watson, 1995: 12)

Nevertheless, the *FE* does make some suggestions about challenging or breaking with, technological civilisation. One obvious option is simply to *stop*.

We'd like a moratorium on industrialization starting right now – a mass strike for the abolition of industrial civilization. Stop the plastics, the steel, the cars, the chemicals, the paint, the logging, the construction of dams and roads, the mining, the exploration of new territories, the computerization. Let's all get in the streets and start discussing what needs to be done, in an anarchic, liberatory way. Let's reforest and reform the cities themselves . . . Stop the exponential growth of information, pull the plug on the communications system. Obviously, we'll need to decide in these assemblies what is absolutely essential for the time being. *But we have a vision of a nontechnological world – let us make that foremost.* (Solis, 1985: 25–6)

There are two aspects to this emphasis: firstly, it is a conscious break with the current order of 'progress' and production, not a continuation of it; secondly, it requires, and is within the ability of human beings, to *choose* a different path:

I believe in the possibility of a conscious break with this civilization and its technology . . . I am not sure how even to begin except to state the existence of such a possibility . . . a new cultural vision must be forged in the rejection of the technological world view and in the struggle against the power of technology over our lives. (Fulano, 1981b: 21)

Resistance to capital may take many forms, including workers' struggles, although its possibilities are limited without the

level of productivity required so that people can develop as free and creative individuals. (Fischer, 1982: 121)

However, this would not happen under capitalism since the social order was organised for the benefit of the few, not for the good of the many. In fact, the forces of production would be held back by the illogicality of capitalism, and could only be freed for the benefit of all humanity by a proletarian revolution.

So although technology was crucial for Marx's vision, he saw it ultimately as subservient to economic social relations, and a change in these relations would enable the existing technology to be used and developed for the good of humanity.

## Jacques Ellul – the autonomy of technique<sup>4</sup>

Ellul has been one of the most important writers on technology since the midtwentieth century. His most well-known work, *The technological society*, has been described as 'one of the most ambitious and widely read attempts to analyze the relation between technology and modern society, and to try to understand modern technology in terms of that relationship' (Mitcham and Mackey, 1971: 102–3). His work in general has been considered as 'among the most important in . . . a vast literature on the nature of technological society and the effects of technology on the life of man' (Lovekin, 1977: 251).

Ellul was a Marxist at 19, but converted to Christianity at 22. He found it impossible to reconcile Marxism and Christian-

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<sup>4</sup> For a brief introduction to Ellul see Ferkiss, 1993: 167–73. On the significance of Ellul on the *FE*, John Zerzan writes 'there has been a willingness in the *Fifth Estate* to consider the sense in which present and future technology tend toward a life of their own. Here there has been an effort to critically assess the extent to which Jacques Ellul is correct that technology is becoming itself an independent system dominating society' (Zerzan, 1982: 2).

ity, with the result that he abandoned the former as an overarching philosophical system. However, he was aware that biblical texts were unable to offer a tool for analysing contemporary society. In attempting to 'deduce . . . political or social consequences valid for our epoch', he still relied on a Marxian approach: 'I did not see why I should have to give up the things that Marx said about society and explained about economy and injustice in the world. I saw no reason to reject them just because I was now a Christian' (Vanderburg, 1997: 14).

However, Ellul was unconvinced by Marx's emphasis on economics and production, believing instead that: 'on the sociological plane, technique was by far the most important phenomenon, and that it was necessary to start from there to understand everything else' (Ellul, 1970: 5).

What does Ellul mean by *technique*? It is an opaque term, and his definitions often conceal as much as they reveal. The most commonly used definition provided by Ellul appears in a 'Note to the Reader' of his book *The technological society*:

The term *technique*, as I use it, does not mean machines, technology, or this or that procedure for attaining an end. In our technological society, *technique* is the *totality of methods rationally arrived at and having absolute efficiency* (for a given stage of development) in *every* field of human activity. Its characteristics are new; the technique of the present has no common measure with that of the past. (Ellul, 1965: 3)<sup>5</sup>

There are three important points to make here. The first is that *technique* is not synonymous with individual pieces of technology. 'Technique is radically different from the machine,'

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<sup>5</sup> This definition was inspired by that of Harold Lasswell – technique is 'the ensemble of practices by which one uses available resources in order to achieve certain valued ends' (see Ellul, 1965: 18).

ken away from the idea of progress, particularly in its Marxian, dialectical materialist form, it does not see anything specific in the present social environment that is necessary for the transition to communism. The revolutionary change therefore does not emerge from within contemporary capitalist civilisation but rather, as Camatte argues, from outside of it. The revolutionary change will be a break with the old order, not a development of it.<sup>13</sup>

Who, or what, though, is 'outside' of capital or civilisation? How does one know if one's group or activity is part or, or in opposition to, capital? This is a problematical area that the *FE* has itself acknowledged in a debate over an article written by Camatte and Gianni Collu. 'On organisation' identified all forms of formal political organisation as 'gangs' or 'rackets' fighting over the spoils of capital. In reviewing this pamphlet, E. B. Maple agreed with Camatte and Collu that that formal organisations at best mirror, at worst increase, the hierarchies present in the rest of society. When it was pointed out that this implied that the *FE* might itself be a 'gang' activity, and therefore a part of capital, Maple replied:

One answer that often strikes me at very cynical points in my life is, very possibly yes. As to the charge that if we accept the [Camatte and Collu] contention, *all* political activity becomes gang activity; again, very possibly yes . . . So, the big question is, if some activity becomes human and does not fall into a unity with capital, who gets tarred and who doesn't? It would seem that any statement from me on that would be arbitrary . . . and self-serving. (Maple and Clarke, 1976: 14)

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<sup>13</sup> Jean Baudrillard has argued a similar point. The fundamental historical break was between symbolic societies and productivist societies; the next (revolutionary) break must entail a return to a society organised around symbolic exchange (see Kellner, 1989: 43–5).

characteristics of technology outlined above; they could even be utilised by State and capital to achieve the transformation of capitalism into a new, more 'sustainable' form. The *FE* argues that, although certain types of technology will be useful, even necessary, in a free, post-civilisation society, there should be no technological prerequisites for the desired social form: 'Whether or not such communities decide, say, to turn into windmills the automobiles left behind by this civilization, is ultimately a secondary, local and technical problem' (*Fifth Estate*, 1983: 4).

Another perspective commonly associated with the Left, and often argued for by those in favour of post-revolutionary high tech, is the need for planning, that is for a planned society to replace the 'anarchy', as it is often unfortunately termed, of the market. However, for the *FE* this is a false promise, based on the premises of mass technology. Firstly, it assumes that such planning is actually possible, assumes that large-scale systems are manageable and all problems can be reduced to logical (i.e., technical soluble) components. Secondly, it assumes that these planned systems can operate within a libertarian social structure. The *FE* disagrees:

Let me say it in clear terms: planning is *impossible* anywhere but at the most localized level and can only take place in a democratic fashion when shared by people who enjoy face-to-face relationships. A computerized, planned world will be a dreadful nightmare . . . We must opt for a non-administered world . . . the schemes of the planners will never work. (Maple, 1982: 7)

## Here to there

There is little in the *FE* to suggest how this state of non-technological society should be reached. Since the *FE* has bro-

he writes, 'it is a radical error to think of technique and machine as interchangeable.' *Technique* is not something external to but is rather a part of human activity – it is 'the consciousness of the mechanized world'. 'Technique', writes Ellul, 'integrates the machine into society' (Ellul, 1965: 5–7).

The second point, demonstrated by Ellul's definition of *technique* being limited to 'our technological society', is that Ellul analyses *technique* historically. *Technique* has always existed, but in previous societies it was contained by a variety of factors which prevented it from achieving autonomy: primarily, that it had a definite and relatively insignificant role in society; that technological means were limited; that it was local; that technological evolution was slow; and that individuals' lives were not constrained and defined by technique, i.e., they could escape (Ellul, 1965: 65–77). *Technique* started to develop its modern, unique form in England and France towards the end of the eighteenth century, and in the United States at the beginning of the nineteenth. However, the above conditions no longer apply to modern *technique*. This historical perspective means is that what Ellul is interested in is not technical action, but the interaction between *technique*, individual and society. It is the nature and degree of this interaction that, Ellul argues, defines contemporary society as 'technological'.

The third point, leading on from the first two, is that Ellul's emphasis is on humans and human society, a perspective on the world, or even a way of being, and this is located within humans, rather than as something outside of them.<sup>6</sup> When Ellul refers to *technique* as being autonomous, therefore, he is not referring to an external entity that acts on humans but as something which is part of human society. As Durkheim saw soci-

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<sup>6</sup> According to one commentator, 'Ellul contends that *technique*, which he regards as a unique mode of consciousness, makes the machine possible, and while the machine aids in the perpetuation of that consciousness, it is not the cause of it; rather, it represents the ultimate ideal towards which all technique strives' (Lovekin (1977: 254); see also Menninger (1981: 114)).

ety as ‘a specific reality with its own characteristics’, so Ellul also believes in a ‘collective sociological reality, which is independent of the individual’ (Winner, 1977: 62; Ellul, 1965: xxvi). *Technique*, for Ellul, represents one such ‘collective reality’; it can be considered, therefore, from a sociological perspective as an autonomous agent, not dependent on the social relations of other spheres. However, *technique* no longer competes with the other spheres, or is limited by them: in technological society *technique* ‘encloses’ all other human activity. ‘In a word, what determines our politics, our economics, our science, our social activities is technique’ (Holloway, 1970: 23).

In some respects, *technique* is similar to Marx’s idea of the mode of production in that it represents a totality that includes consciousness as well as artefacts; but, as mentioned above, Ellul does not believe that economic or productive factors are preeminent. ‘It is self-deception to put economics at the base of the Marxist system. It is technique upon which all the rest depends . . . It is useless to rail against capitalism. Capitalism did not create our world; the machine did’ (Ellul, 1965: 150).

In attempting to clarify the relationship between *technique*, society and the individual in the ‘technological society’, Ellul develops a set of ‘characteristics’. The first two of these he refers to as ‘well known’, and does not go into them further; they are rationality and artificiality. By rationality, Ellul means here the application of logic and design to overcome spontaneity: ‘Every intervention of technique is, in effect, a reduction of facts, phenomena, means, and instruments to the schema of logic’. By artificiality he means that ‘technique is opposed to nature’, and it ‘destroys, eliminates, or subordinates the natural world’ (Ellul, 1965: 79). There are a further five characteristics, however, that Ellul refers to as ‘new’ and which are the defining characteristics of modern, autonomous *technique* (Ellul, 1965, chapter 2). I will outline these because they are central to Ellul’s approach and because they were referred to in

subsistence and culture in their own back yards with convivial tools in which technical matters play only a minuscule and sporadic role in their lives and where nature looms large’ (*Fifth Estate*, 1983: 4).<sup>12</sup>

Their aim is not only a society free of the State (or any authoritarian political structures) and capital, but also free of technology. This is not a society without tools, but one not ordered around the technological system either. Instead, the social should have priority: ‘Reduced to its most basic elements, discussions about the future sensibly should be predicated on what we desire *socially* and from that determine what technology is possible’ (*Fifth Estate*, 1979b: 6). Because of this emphasis, alternative or appropriate technologies are treated with scepticism. The *FE* agrees that there are ‘forms of technics that humans can understand and control’ and that the development of these represents ‘some of the practical activities which will help to make our escape from technological civilization a reality’ (Brubaker, 1983: 2). But the problem is social and cultural – it cannot be solved by pieces of technology, and the belief that it can is simply another manifestation of the technological consciousness.

A further criticism of ‘alternative’ technologies is that they are not inherently in opposition to capitalism or mass society – solar, wind and wave power could be developed on a massive scale, and functionally integrated with modern industry. Large and/or high-tech ‘alternative’ technologies would still have the

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<sup>12</sup> The term ‘convivial tools’ comes from Ivan Illich. Illich argues that tools are a necessary and important part of human society, but may be either mastered by people or masters of them. ‘Convivial tools are those which give each person who uses them the greatest opportunity to enrich the environment with the fruits of his or her vision’ (Illich, 1990: 21). However, Illich tends to focus on the tools and machines themselves, rather than on the social relationships of their construction, maintenance and use. So, for example, a telephone is a ‘structurally convivial tool’, because it allows communication and the conversations carried are not amenable to bureaucratic or government control.

## Possibilities

The *FE*'s critique of the technological society is comprehensive. After the critique, however, the question arises as to what alternatives are possible, and how these could come about.

## Alternatives

As with much of the revolutionary Left, the *FE* has avoided blueprints of its alternative society. In part, this is consistent with its determination to avoid a political programme, a programme which would be, in effect, an extension of the society which it criticises.

We are proposing nothing less than the radical deconstruction of society, but this cannot come about through a political and technological program with its blueprints and agendas, for that would be more of the same . . . *all* programs, by their nature of emanating from a central source outward to the 'masses', are inherently authoritarian and conservative. (Fulano, 1981a: 8)

There is clearly the implication, though, that a workable anarchist society would be based on small communities, and that tools and pieces of technology would be small and/or simple enough to be integrated fully into such a society. David Watson refers to 'a world in which human beings create their own

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jection of technology need not entail a rejection of science. See for examples Ellul's discussion of the Ancient Greeks (Ellul, 1965: 28ff.). Referring to this, Fulano argues that 'the notion that a scientific world view demands a technological outlook is simply not necessarily so. It is pure technological propaganda . . . the fact that the Greeks could have a scientific outlook without a technological-utilitarian basis proves . . . that such a conception of life is possible, and therefore a scientific society without slavery and without technology is also possible' (Fulano, 1981b: 7).

the first major exposition of the *Fifth Estate* 'anti-tech' position (see Fulano, 1981a).

It is *automatic*. The one law of *technique* is the search for efficiency, or what Ellul calls the 'one best means'. This is the only principle for action, and therefore human judgement and spontaneity are irrelevant and unnecessary.

It is *self-augmenting*. Since every invention leads to other inventions, there is a knock-on effect such that technical progress occurs by a geometric rather than an arithmetic progression. This process is unpredictable and outside of human control. It is also irreversible. *Technique* creates new, technologically-dependent ways of doing things, replacing traditional methods; once certain skills are lost, they are rarely recovered.

It is *unitary or holistic*. All the different *techniques* combine to form a whole.

Ellul refers to 'the necessary linking together of techniques' (1965: 111). There can be no distinction made between different *techniques*, or between *techniques* and the use to which they are put.

It is *universal*. *Technique* is a civilisation or culture. As such, it must take over and destroy indigenous cultures with which it comes into contact. Everywhere, technique produces the same results, and cannot therefore be assimilated.

It is *autonomous*. Since efficiency is the only criterion for success, *technique* is autonomous of morality, and of politics and economics, which will change to suit its needs and requirements. Humans, as a potential source of error and inefficiency, must be eliminated from technical systems wherever possible; where humans are still necessary for the functioning of the system they must capitulate to the necessity of *technique*. Consequently, human freedom is constrained by *technique*. For Ellul, 'there can be no human autonomy in the face of technical autonomy' (Ellul, 1965: 138).

These five characteristics in effect offer an expanded definition of technique *in the current technological society*, and have

been utilised by the *FE*, as will be seen. However, before moving on to examine their position, it is first necessary to consider the work of the third main influence, the French ultra-Leftist Jacques Camatte.

## Jacques Camatte – the real domination of capital

The third influence on the *FE* was Jacques Camatte. Camatte's ideas were not specifically about technology, so I will only touch on them briefly, but they are important in the development of the *FE* view of the nature of capital as a culture and civilisation, rather than simply as an economic system.

Camatte was originally a follower of the Italian Marxist and active member of the Italian Socialist Party (PSI), Amadeo Bordiga.<sup>7</sup> Bordiga developed his own views on a number of key political and economic issues, but largely he stuck closely to the communist programme as laid down by Marx and Engels in 1848 (Buick, 1987: 13). He stressed that socialism was a non-market, propertyless and moneyless social form, and it was this that inspired many pro-communist groups, particularly in France, in the 1960s and 1970s, groups that can be classed under the rubric 'neo-Bordigists'.<sup>8</sup> What is significant theoretically is that 'all the French currents put at centre stage . . . the

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<sup>7</sup> Amadeo Bordiga and the theoreticians close to him were known as the Italian communist Left. For his relevance and context, see the translator's note to Camatte and Collu's 'On organization', in Camatte (1995: 28–9).

<sup>8</sup> Goldner describes these as: 'French currents influenced by Bordiga, but not slavishly; the best of them attempted to synthesize Bordiga, who was oblivious to the historical significance of soviets, workers' councils, and workers' democracy, and who placed everything in the Party, with the German and Dutch ultra-Left who glorified workers' councils and explained everything that had gone wrong after 1917 in terms of "Leninism"' (Goldner, 1999).

When the 'means of production' are in actuality interlocking elements of a dangerously complex, interdependent global system, made up not only of technological apparatus and human operatives as working parts in that apparatus, but of forms of culture and communication and even the landscape itself, it makes no sense to speak of 'relations of production' as a separate sphere. (Bradford, 1990: 10)

Clearly, from this perspective, changing the formal ownership of the 'means of production' will be of little consequence if the technological apparatus remains in place:

It is not a question of 'evil men' but the totality of a system . . . Naturally, capital is more than just technology, but *it is also the technology and the human relations it creates*. No such apparatus could appear out of nothing; it presupposes relations of hierarchy and domination irrespective of the formal and juridical property forms. (Bradford, 1981: 10, emphasis in the original)

Here the *FE* makes its point explicit: the properties of modern technology to act on social life make it a form of social relations, and as such a clear distinction between capital and its technology is impossible. Technology is able to swallow up all attempts to control it. It is not that the *FE* disagrees with Marx when he argues that the problem is not with 'things' but with social relations – but it sees technology as social relations, not as things. '*Technology is capital*, the triumph of the inorganic, humanity separated from its tools and universally dependent on the apparatus' (Fulano, 1981a: 5).<sup>11</sup>

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<sup>11</sup> Fulano also makes the point that it is technology that opposes tools, since the system of technology makes human-centred tools irrelevant. A re-



5. *Ecology and technology*: Industrial technologies are inherently damaging to the environment: outcomes are not foreseeable; there are not solutions to all problems; mistakes are inevitable; contamination is an inevitable part of the industrial system.
6. *Human subjectivity*: The ways in which humans view the world, their imaginations and perceptions, become adapted to the technological world. Humans begin to think and act in terms of the machine.
7. *Computerisation and information technology*: Computers and IT do not represent a potentially liberatory technology. As well as being the product of a vast technological structure, they channel a limited form of information which is amenable to, and representative of, capital.

Obviously, the above characteristics describe a technology which is radically different from that commonly held to be a neutral and potentially beneficial set of tools. This is a view held by many libertarian socialists and anarchists who still see the primary focus of their political critique as being the State and capitalism. This is, of course, rejected by the *FE*, for whom, ‘opposing the state while at the same time defending technology or remaining indifferent to it is comparable to opposing the police force while saying nothing about the military. They are part of a unitary whole’ (Bradford, 1981: 10).

It was noted earlier that the Marxian view of capital is that it is a social relation not a thing. However, Marx also saw technological things as not being capital – that is, the means of production were separate from the relations of production i.e. how production, and society, was organised. But, as George Bradford points out, if modern technology is theorised with the characteristics noted above, then the idea of the means and relations of production (in the Marxian sense) being different makes little sense:

so-called “Unpublished Sixth Chapter” of Volume I of *Capital*’ (Goldner, 1999). This was the originally planned Part Seven of Volume I of *Capital* (Marx intended the present Part One to be an introduction, hence it was originally Chapter Six). It is entitled ‘Results of the immediate process of production’, and was first published in Russian and German in Moscow in 1933. It did not attract attention in Western Europe until republished in German and other Western languages in late 1960s. Its first English publication was in 1976 as an appendix to the Penguin edition of *Capital I* (Marx, 1976). A central element of the Sixth Chapter is Marx’s identification of two periodisations of capitalism, namely the formal domination of capital and the real domination of capital (also known as the ‘formal and real subsumption of labour under capital’). The formal domination of capital involves pre-capitalist forms of production being maintained under capitalism: the relationships of production have changed (i.e., become worker-capitalist) but the nature of the production process remains the same. However, under ‘real domination’ an entirely new mode of production comes into existence, with new technologies and forms of social organisation promoted by and beneficial to capitalism. What Camatte extrapolates from this is that, as the process of revolutionising production continues under the conditions of ‘real domination’, it gradually permeates all aspects of society.

In Camatte’s version, capital moved on from real domination over the economy and politics (bourgeois society) to real domination over humans in their biological being (material community of capital). (Trotter, 1995: 13)

Rather than being riven with, and eventually destroyed by, contradictions, capital is able to absorb them and utilise them to its advantage. The proletariat is not, under the conditions of real domination, an opposition to capital, but part of it. Capital becomes representation, that is represented in the minds

and bodies of human beings. It becomes anthropomorphised and therefore escapes the previous limitations that held it in check, including natural barriers which cannot be regarded as insurmountable. For Camatte, 'capital has run away . . . it has escaped' (Camatte, 1975: 13).

The separation of the forces of production from humans (since these are controlled by capital) and the absorption of the proletariat mean that the growth of productive forces is no longer a means to the formation of community (*Gemeinwesen*):

Communism is not a new mode of production; it is the affirmation of a new community . . . Until now men and women have been alienated by this production. They will not gain mastery over production, but will create new relations among themselves which will determine an entirely different activity. (Camatte, 1975: 36)

Camatte uses the term 'domestication' to describe the condition of humans who have internalised the rationality of capital. For Camatte, historical materialism represents only 'a glorification of the wandering in which humanity has been engaged for more than a century: growth of productive forces as the condition *sine-qua-non* for liberation' (Camatte, 1975: 23). The development of productive forces is carried out by capitalism, and there is no clear way in which to differentiate capitalism from communism. As such, there are no negating forces within capitalism and these can only arise outside of it. The only way to overcome domestication is 'to reject the entire product of the development of class societies' (Camatte, 1975: 61–4).

So autonomous capital is no longer capital controlled by the ruling class: it is a material community which is all-encompassing and does not hold its contradictory nemesis (the proletariat) within it. The revolution will therefore be a human revolution to abandon capital, not a proletarian one to claim it for its own.

Arguing that 'technology does not increase choices', but 'imposes its own limited technological range of choices', the *FE* does not see cyberspace as an area of contestation:

The notion that this 'information field' is a contested terrain is naïve, to say the least. The very existence of such a 'field' – in reality a web of abstract, instrumentalized social relations in which 'information' reproduces itself through alienated human activity, just as the system of value reproduces itself through the false reciprocity of commodity exchange – is itself the essence of domination. (Bradford, 1984b: 8)

## Technology is capital

To sum up the *FE* position as outlined so far, there are seven areas regarding modern technology that need to be considered in any analysis.

1. *Social Production*: Individual products and technologies cannot be considered in isolation from the productive processes which produced them.
2. *Social use*: Technology cannot be separated from its use. Technology demands that humans conform to laws implicit in the technology itself.
3. *Social and political organisation*: Modern technologies require hierarchical and authoritarian forms of social organisation in order to function.
4. *Dependency and expertise*: Technological systems require a dependence of humans on these systems, and on the experts that develop and run them.

## 7. Computer and information systems

One area of modern technology which is often cited as being both of importance to radicals and activists today, and also potentially indispensable to an anarchist society, is information technology (IT). The *FE* questions this assertion, firstly on the basis of the points raised above regarding social production, use and organisation – ‘How do you expect this sophisticated equipment to be produced? What will be the role of the experts who supervise the production of the machinery as well as the dissemination of . . . information?’ – but also regarding the very nature of the technology itself (St Jaques *et al.*, 1980: 3). For the *FE*, computers and information systems are not simply a way of communicating neutral information. Information, in the way that it is understood today, is itself a development and manifestation of capital. Computers effectively act as filters which only allow certain forms of communication, and these forms themselves are central parts of the social relations of the techno-capitalist society.

*Information* is no more neutral than technology. It is a form which capital has taken since the technological revolutions beginning in the middle of this century . . . The kind of information which is transmitted through satellites and computer systems is a form of domination and power, inherently centralized, authoritarian and technocratic. (St Jaques *et al.*, 1980: 3)

Modern communication techniques promote cultural homogeneity through demanding a universalised form of communication based on the requirements of *technique*. Rather than diversifying human experience it standardises it, imposing ‘a universal impoverishment and homogenization of human experience’ (Fulano, 1981a: 7).

These three thinkers gave the *FE* a framework in which to develop their critique of technology – from Marx, that the key to the systems of oppression in any epoch are to be found in social relations; from Ellul that *technique*, as a form of consciousness and social entity could have a key role to play in the development and maintenance of such systems, independent of the socioeconomic form; and from Camatte, that Marxian ideas of the limitations of capital, the revolutionary role of the proletariat, the necessity of developing the means of production were invalid for the late twentieth century.

The *FE* now attempted to integrate these strands into a perspective that sought to illuminate the links between culture, economics and technology, between capital and *technique*.

## Technology, *technique*, and capital

As Ellul uses the term *technique* to describe the technological system and outlook, the *FE* has tended instead to use *technology* in the same way, i.e., as a system rather than as individual tools or machines. David Watson has referred to it as ‘an interlocking system of apparatus, rational techniques and organization’ (1995: 11). Elsewhere, writing as George Bradford, Watson has attempted a more formal definition, utilising the words *technique*, *technics* and *technology*. Here, it is technology that comes closest to Ellul’s idea of *technique*:

Probably, the most workable approach for our purposes would be to suggest a provisional definition of these terms, considering *technique* to be that procedural instrumentality . . . which is shared by all human societies but which is not necessarily identical in its motives or its role in those societies; *technics* to be technical operations using tools or machines . . .; and *technology* to be the *rationalization* or science of techniques . . ., the geometric

linking together, systematization and universalization of technical instrumentality and applied science within society, which brings to light its emergence as an autonomous power and social body. (Bradford, 1984a: 11)

Here we have the essence of Ellul's approach: a differentiation between a simple instrumentality and operation and a 'social body' which involves the 'systematization and universalization' of this instrumentality into a form greater than the sum of its parts, i.e., a focus on the social relations of technology/technique under specific historical conditions. Unfortunately, this does appear to complicate the discussion. The problem is that the terms used can be taken in three ways: they have everyday meanings, more specialist meanings, and then the radical analytical meanings used here. As George Bradford replied to a Marxist critic who argued that the *FE*'s concept of technology made no sense since it did not conform to the dictionary definition of the term:

If [he] were to look up capitalism in his dictionary, he would find nothing about exploitation, alienation, or domination, only a reference to the private ownership of the means of production. Would he therefore conclude that discussion of capitalism as more than private ownership, as a system of domination, is merely a 'theoretical device?' (Bradford, 1984a: 11)

A problem also arises regarding Ellul's work with the use of the French word *technique* and its translation as 'technology'. It has been pointed out that:

for Ellul technique equals a systematic unity of all rationalized means, an idea which is not necessarily implied by the English 'technology',

Tools and machines are not mere instruments, he argues, 'they are pregnant symbols in themselves . . . A tool is a model for its own reproduction and a script for the reenactment of the skills its symbolizes . . . [it] thus transcends its role as a practical means towards certain ends: it is a constituent of man's symbolic re-creation of his world'. (Campion, 1988: 17. The quote is from Weizenbaum, 1984: 18)

Elsewhere David Watson argues: 'Neither tools nor technology are neutral. They are inevitably powerful constituents of our symbolic world. Technology imposes not only form but content wherever it comes into use' (Watson, 1995: 11).

The human imagination will necessarily see possibilities for interacting with and changing the world on the basis of the tools available. The tools therefore offer a template for their own replication, which is the externalisation of the internal technological consciousness. Furthermore, if it is accepted that this imaginative content also defines how the human individual sees themselves, the technological world also inevitably means the internalisation of a technological human being.

This is particularly noticeable in the case of the media, what Watson terms 'capital's global village'.

A sky reminds us of a film; witnessing the death of a human being finds meaning in a media episode, replete with musical score. An unreal experience becomes our measure of the real . . . The formation of subjectivity, once the result of complex interaction between human beings participating in a symbolic order, has been replaced by media . . . we are becoming machine-like, more and more determined by technological necessities beyond our control. (Watson, 1999: 131)

and roadways, sprayed on food crops, every day, everywhere. The result may not be as dramatic as Bhopal . . . but it is as deadly. (Bradford, 1988: 50)

Although this currently applies to a system organised under market-capitalist social relations, the *FE* is clear that these problems are inherent in the technological and industrial system.

You cannot have petrochemicals without colonies and sacrifice zones . . . waste pits, oil spills, refinery row, ruined areas and lives . . . Show me the non-polluting, convivial, democratic, peaceful model in which industrialism and technology could exist after a revolution. I don't think it can be done. (Watson, 1995: 10)

## 6. Human subjectivity

Another aspect of the *FE* critique is its argument that how humans view their world is determined by the prevalent social relations – following Marx, people are how they live: 'As individuals express their life, so they are' (in Bottomore and Rubel, 1963: 69). When humans are enclosed in a mass technological apparatus, their subjectivity becomes adapted to this – i.e. humans change to suit the technological world. In the technological society, all reference points are technological. Human needs and expectations are conditioned by what is technologically possible.

The human being is transformed along with the content of social life . . . [the means of production are] the daily activities of the people who participate in these systems, and . . . require the inevitable characterological internalization of these means in human beings. (Bradford, 1984a: 11)

Dogbane Campion refers to Joseph Weizenbaum's book *Computer power and human reason*:

nor precontained in the French *technique*. In each case there is an extension of the common sense meaning of the term which must be argued for. (Mitcham and MacKey, 1971: 105)

'Technology' is used in the *FE* presumably because that is the term most familiar to English-speaking readers, and because the debate in the *FE* referred to 'technology' before the introduction of Ellul's ideas in the paper in 1981.

Like Marx, the *FE* recognises the primacy of social relations in defining a historical epoch, and, like Ellul, it recognises the importance of technology independent of other social factors. From Camatte comes the recognition of the over-arching dominance of the techno-capitalist system and its ability to escape its limitations. However, unlike Marx it does not see technology as being neutral; and unlike Ellul it does not give complete primacy to technology, instead seeing it as integral to a system that is driven by both technology *and* capital:

'The capitalist system has been swallowed up by the technological system,' writes Ellul. But he misses the point: technology and capital are both surpassing their limitations in runaway fashion, but neither has been swallowed by the other. (Bradford, 1992: 19)

The term the *FE* uses to describe this system is 'megamachine', a term borrowed from Lewis Mumford. Mumford argued that the first machines were not the mechanical products of the Industrial Revolution, but rather belonged to the civilisations of the ancient world. Megamachines were forms of social organisation, organised by élites, with the aim of achieving particular ends that would be beyond the means of small-scale community activity. After the collapse of these early civilisations, the megamachine disappeared from history, only to re-emerge in our own time. Mumford argues that both new and

old megamachines '[are] mass organizations able to perform tasks that lie outside the range of small work collectives and loose tribal or territorial groups . . . [which] aim to ultimately exert control over the entire community at every point of human existence . . . [with an underlying ideology that] ignores the needs and purposes of life in order to fortify the power complex and extend its domination' (Miller, 1995: 345–6). The *FE* uses this term to describe the contemporary interlocking system of the State, corporations, bureaucracies, the military and technology.

## Technology as historical agent

The *FE*'s critique of technology is applicable, like Ellul's, only to the current socioeconomic form of organisation, that is, it is a historical manifestation. Technology is not, therefore, strictly deterministic: technology has not *necessarily* determined the course of history, since it is only autonomous under certain specific historical conditions.<sup>9</sup> In earlier, non-technological societies, technology was absorbed within the social matrix and did not occupy a separate sphere (something that was also true of other abstract forms such as 'production').

Technical operations existed (and exist) in societies which are non-technological. The technical phenomenon does not come to define all activity in the society, does not shape the social content. Rather, it is a secondary, sporadic mediation, embedded in culture. (Bradford, 1984a: 11)

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<sup>9</sup> Early *FE* statements veered more towards determinism, but this has been less evident in later works. See *Fifth Estate*, 1978; *Fifth Estate*, 1979b. Here technology is seen as an inherently alienating form of mediation with the natural world. This perspective has been developed by John Zerzan (see Zerzan, 1988 and 1994).

involved, or with high-capacity forms of travel, such mistakes can have catastrophic consequences. The blame for these mistakes is often laid at the door of corporate greed, the profit motive, or the irrationality of the market, implying that if the system was not run along capitalist lines ecological disasters would not occur. Dave Watson writes: 'Global industrial production might possibly be accomplished without capitalist economic relations, but it cannot avoid honest mistakes . . . [I]ndustrialism . . . makes disasters inevitable' (Watson, 1996: 137).

The fourth problem is that *contamination* is an *inevitable* by-product of large, industrial technologies. After the release of a deadly gas cloud from the Union Carbide factory in Bhopal, India, which killed 3,000 people and disabled 20,000 more, George Bradford made a number of points which indicted industrialism: he noted that this was not a 'one off' in the Third World where predominantly Western companies have operational standards below what would be tolerated in the US and Europe; that similar, if smaller, 'accidents' also occur in the US and other 'developed' countries; and that the constant usage of chemicals contaminates the environment to a dangerous level even without the occurrence of such disasters.

When a resident of the US living with a risk of hydrogen-cyanide poisoning from factory wastes referred to the use of this gas in Nazi extermination camps, Bradford commented:

A powerful image: industrial civilization as one vast, stinking extermination camp. We all live in Bhopal, some closer to the gas chambers and to the mass graves, but all of us close enough to be victims. And Union Carbide is obviously not a fluke – the poisons are vented in the air and water, dumped in rivers, ponds and streams, fed to animals going to market, sprayed on lawns

Technology cannot be isolated from itself and studied with its own techniques. The laboratory experiment in a given geographical or social area performed by the huge, powerful, bureaucratic hierarchy of technicians and managers *is* technology and carries its own social implications within it. The results of innovation will necessarily have multiple and unpredictable significance to the different sectors of the megamachine. (Fulano, 1981a: 8)

The second problem is that *solutions are not inevitable*: the focus on the supposed efficacy of technology and applied science generates a belief that, eventually, solutions can be found to any and all problems. Ironically, more technology is often seen as the only solution for problems that have been technologically induced.

What is to be done with chemical and nuclear wastes? Here the technicians smile and say, 'You need us.' But their 'solutions' not only legitimize and tend to prolong the original causes of the disaster, but tend to aggravate it even further. Now we are faced with the innovation of chemical waste dumps to solve the problem of toxic wastes, which is already proving to lead to other difficulties. But we need technology, they argue, we've got to put this stuff somewhere! And to not join in the chorus is to seek 'easy answers'. (Fulano, 1981b: 8)

The third problem is that *whereas solutions may not be inevitable, mistakes are*: whatever attempts are made to prevent mistakes, mechanical or human error is inevitable at some stage. When highly toxic or explosive materials are

The clearest example of this is found in 'primitive' societies. The FE does not offer a definition of the primitive. It is a characterological category (located in the characteristics of primitive society), rather than a chronological one (located in time), although there is a chronological element to the extent that primitive society was the first form of human society and has subsequently been replaced by civilisation. These characteristics are: the absence of a formal economy; the preeminence of the symbolic and the absence of a separate sphere of production; the absence of coercive political power; a participatory and egalitarian epistemology; a harmonious ecology; and the active limitation of needs and the refusal of power and civilization. The term primitive, or sometimes primal, is also used to mean original, i.e., the original form of human social existence (see Millett, 2003).

The two-fold character of primitive technics – its adequacy (or appropriateness) to its environment, and its relative insignificance in terms of the constitution of primitive society – point to its fundamental quality: primitive technics is simply a modality of human being. (Brubaker, 1981: 19)

Technology was only allowed to emerge as a potentially autonomous entity with the breakdown of the community structures which had held it in place, possibly through the emergence of a system of labour and production (an argument also offered in Fredy Perlman's (1983) *Against His-story, against Leviathan!*)

Consequently it would be a mistake to accuse the FE of criticising technology *as such*, since no such ahistorical form exists (in the same way that there can be no capital *as such*). As the FE responded to some of its critics:

You accuse us of advocating destroying all machines, something we have never done . . . We

don't define the nomad's shoulder strap or spear as technology. If it is, and everything from rubbing flints to computerized nuclear reactors is defined in the same category, then th[e] word is incoherent. We are talking about advanced, industrial technology, the stuff of civilization. (St Jaques *et al.*, 1980: 14)

The emergence of technology as a separate sphere created the potential for a technological society, although it required a complete breakdown of the old communal forms to permit its complete emergence. This breakdown was brought about by a combination of technology and capitalism, neither being dominant overall, but with one or the other having a crucial effect at a particular time and place.

Although there has been controversy over whether new technologies and timekeeping spurred early-capitalist mercantilism, or whether the reverse was the case, there is no reason to choose one interpretation over the other. Synergism was here in effect: technical development and capitalism went hand-in-hand, creating in their wake the technological civilization of today. (Fulano, 1981a: 5–6)

Capitalism and industrial technologies emerged together, one reinforcing the other, synergistically (i.e., the total effect being greater than the sum of its parts). The ultimate origins of the technological society, then, lie in the breakdown of primitive society and the rise of civilisation; but technology did not begin to appear as a separate social entity until the rise of capitalism. From that point, both evolved together as interlinked, mutually supporting systems of domination.

other areas it will be necessary to defer to the knowledge of experts in the field. This is particularly difficult because one of the problems with expertise is not simply the profit motive but a determination to succeed at the technical task at hand, a determination which may well outweigh any commitment to the wider social good.

Even technicians who are not out simply to preserve the privileges and the power which come from their project . . . believe in their system and will change figures, make errors of omission, and argue for solutions which are actually untenable. Those of us who are not there with the expertise and the information . . . will have to take their word for it. (Fulano, 1981b: 6)

A society based on high technology will therefore inevitably operate with a high degree of opacity regarding technical, and therefore social, issues which will undermine any attempts at transparent direct-democratic participation.

## 5. Ecology and technology

Modern technological systems are inherently complex. This suggests four possible roots of potential environmental problems.

Firstly, *indeterminacy of ends*: when the technologies are very large-scale and/ or deal with extremely complex systems (such as the human body or natural ecosystems), the possible outcomes of their use are impossible to determine with any degree of accuracy. In fact, such unforeseen outcomes may be extremely damaging, as in the cases of DDT and the Thalidomide drug. This epistemological problem is not surmountable, since there is no way to study technology outside of the totality of the 'megamachine'.



specialization of labor, stratification of tasks, and bureaucratic management techniques. (Bradford, 1984a: 11)

The political organisation of any society which utilises this technology is therefore given, and cannot be reorganised along decentralised and community lines as long as such a system is maintained.

Furthermore, the *FE* questions why anyone in a free society would decide, voluntarily, to work in a factory or a mine. Following Solzhenitsyn in *The Gulag Archipelago*, they refer to forced labourers as ‘zeks’.

Every middle-class Marxist I’ve ever met has expressed the same desires for a multifaceted life after the revolution. It doesn’t sound bad, but I’ve never heard one of them say that they wanted to be a coal miner in the morning, a forge operator in the afternoon and a micro chip board assembler after dinner. Tasks like these, done by zeks, are the foundation of industrial capitalism and if we drag the same old shit into our new society, they will also be done by zeks. (Maple, 1983: 2)<sup>10</sup>

The maintenance of a technical-industrial system will require a division of labour that will inevitably result in a worker-class, and it is unlikely that this could exist without an authoritarian political structure.

#### 4. Dependency and expertise

The nature of the technological systems requires a dependency of humans both on the system itself and on the experts who run it. The complexities of this system mean that it is impossible for an individual to understand how anything but a small part of it works (although this in itself presumes a willingness to immerse oneself in technological know-how). In all

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<sup>10</sup> The term ‘zeks’ was first employed in this way by Perlman (1983).

## The critique of technology – realities and considerations

The *FE* view of technology was developed over many years, and although it has been treated in some depth it has never been set out systematically. The seven elements outlined below, which the *FE* identifies as crucial to any consideration of the modern technological system, have been consolidated from a number of different articles. The *FE* itself has not catalogued its critique in this way. This is a representation of an overview of its position as it has developed.

### 1. Social production

The *FE* maintain that all goods and manufacture have to be looked at in the context of social production – that is, from their genesis on the drawing board to their delivery to the shop or wherever. There may also be additional elements required for their use, such as fuel for powered goods. The production process requires human parts, a division of labour between scientists, engineers and designers at one end and shop-floor workers, miners, labourers and so on at the other. It also requires an apparatus of communication and distribution that in itself entails other technologies and productive processes. In addition, raw materials have to be extracted and petroleum products refined and transported. Fulano notes that ‘technology encompasses the entire social process, the means and the instruments of production of these products, not just the products alone’(1981b: 6).

It is, therefore, never possible to assess a product simply by looking at the product alone, outside of the complexities of the system in which it was produced.

## 2. Social use

The principle of the social use of technology is summed up by Langdon Winner in his book *Autonomous technology*. He writes:

The human encounter with artificial means cannot be summarized solely (or even primarily) as a matter of 'use'. One must notice that certain kinds of regularized service must be rendered to an instrument before it has any utility at all. One must be aware of the patterns of behaviour demanded of the individual or of society in order to accommodate the instrument within the life process. (Winner, 1977: 194–5)

For small technologies, integrated in society, this need not be a problem. For example, a cup is designed with a handle which will encourage it being used in a particular way, although picking it up without the handle is quite possible and will not have any great consequences (except possibly burnt fingers). Larger, more complex technologies suggest ever more limited ways in which they may be used efficiently (or indeed, at all) as well as requiring a greater social adaptation to their use (i.e., the human and natural environment is altered to suit the technology). When these technologies assume the scale of telecommunications systems, for example, they demand high levels of conformity of both those who use them and those who operate and maintain them – spontaneity is effectively 'designed out'.

As we become increasingly dependent on technology, and as it generates new needs which can only be satisfied technologically, we are left with no choice but to use the technologies and conform to their requirements. In fact, in the end we end up adapting ourselves to the technologies, not the other way around.

Technology is not a simple tool which can be used in any way we like. It is a form of social organization, a set of social relations. It has its own laws. If we are to engage in its use, we must accept its authority. (Fulano, 1981b: 6)

How these two characteristics combine is illustrated in the quotation below in which George Bradford examines the difference between 'tools' and 'technology', between the spear and the missile. A spear has inherent limitations, and the damage that can be done with it is limited without a complete reorganisation of the society in which it is used (demonstrated by the armies of ancient civilisations). But in the case of the missile:

the organization of human beings as a machine, as a network of production and destruction, is fundamental to what is produced, and the only limit implied is that which is attained with the ultimate annihilation of the human race by its technology. (Bradford, 1984a: 11)

## 3. Social and political organisation

For the *FE*, an authoritarian and hierarchical social and political form is implicit in technology, and cannot be separated from it. This is the wider implication of the two previous characteristics given above, that the technological system demands a division of labour and a hierarchical and authoritarian political structure.

The enormous size, complex interconnection and stratification of tasks which make up modern technological systems make authoritarian command necessary and independent, individual decision-making impossible . . . The massified technical structure can only exist through extreme