Part II

Papers
TECHNOLOGICAL CHANGE AND POLITICAL AWARENESS IN ADVANCED INDUSTRIAL SOCIETIES

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Descriptions of advanced industrial societies in the post-1945 period have frequently emphasised the scientific technological nature of the development of such societies. Contemporary positivists have hailed technological development as the cornerstone of social progress, while technological determinists have sought to show its inexorability. It is widely accepted that there has been an exponential growth in scientific and technological activity since World War II. Since the work of scientists has been increasingly in applied fields, the traditional, popularly-held distinction between science (concerned with the 'discovery' of 'laws of nature') and technology (concerned with the application of science in order to exercise human control over the environment) has practically diminished: hence the concept of scientific-technology. Additionally, we should note that the concept of scientific-technology has also come to refer to the increased knowledge basis of technological development, as opposed to developments in the past which were based rather more on intuition and ad hoc processes. One of the major characteristics, therefore, of the advanced industrial societies is the phenomenon of scientific activity in conscious pursuit of technological goals and technological activity consciously dependent upon scientific research. This is arguably what constitutes the 'new industrial revolution'.

This 'new industrial revolution' raises important issues concerning the relationship between technological development and society. These issues must be explored in order to arrive at some understanding of the relationship between technological change and political awareness. Here we encounter two opposing perspectives: the first, that technological development is subordinated to social processes, and the second, that social processes have become subordinated to technological development. In reality, however, these two perspectives frequently converge. An orthodox Marxist view of innovation in manufacturing technology in the 19th century - in the forces of production - suggests there was little in the way of choice. In practice, technology
determined the pattern of social relations; in other words, technology in the static sense possesses a certain autonomy since instruments of technology were easily detached from their social contexts. But technology in the dynamic sense - as a process of development - was socially and economically constrained. Consequently, there was no reason why James Watt's steam engine should not have been applicable in all kinds of societies, but, initially, in capitalist England, it could not have reached the final stage of development without entrepreneurial support.

However, there are forceful arguments today which suggest that since 1945 technology in the advanced industrial societies is itself a prime agency of social change. A whole series of developments have significantly affected, and are continuing to affect, the social and economic fabric. Scientific-technology has gained a self-momentum, where innovation itself has become an industry, and consequently, a socio-economic force; not only does scientific-technology have relative autonomy, it also dictates the manner in which social relations themselves are constituted. Technology has extended human capabilities in a qualitative fashion, at the same time ensuring that desired effects are produced with the minimum of waste. As with traditional machine production, the application of advanced scientific-technology demands division and specificity, but - to use the language of information technology - within a more digital framework (as opposed to the analogue perspective of 19th century factory industry). The digitalized elements of production are required to be integrated through a process of centralized control - as we can surely see in modern computerized systems of industrial manufacturing.

Scientific-technology thus seems to impose an order demanding a kind of obedience in the acceptance of a functional status quo. To conceive of technology in terms of 'tool use' is to be anachronistic - and yet, of course, reflects the fact that the prevailing conceptual framework in advanced industrial societies is one which is based on a traditional technological order. As a result it might be thought that the notion of technological politics becomes relevant. Here, human ends are adjusted to the available technological means and technological norms are central human values. Ends must be defined precisely to suit prevailing techniques so that, for example, the desire to communicate is defined as a demand for a telephone or that music appreciation is seen as hi-fi ownership. Technological politics, as those such as Herbert Marcuse have argued, completely negates the notion that technology is ultimately subject to human control. Rather, the opposite is the case in the advanced industrial societies, for it
would seem to be that it is the structure of technical achievements that largely determines what are actually human problems, that is to say, political problems.

This perspective on scientific-technology can be illustrated through a brief examination of the nature of information technology. The microprocessor - the heart of the modern computer - has been judged to have inevitable consequences for employment (in addition to social control and issues of privacy). It will tend to reduce the amount of time spent on manufacturing a product or producing a service because of either a reduction in the number of components needed in many products or because of the automation and speeding-up of production lines and office operations. This is now a reality and is reflected in the incorporation of robotics in engineering studies in many institutions concerned with technical education and wordprocessing in the training of typists. The assumption is that the application of microprocessor technology calls for training in new skills; the greater likelihood, however, is that it leads to a significant fall in employment (even in the electronics industry). There has been talk of the 'collapse of work', quite apart from the effects of economic 'recession' (or of the policies of governments), with previously labour-intensive industries either disappearing altogether or else becoming relatively capital-intensive.

Now, we might argue that microprocessor technology itself does not determine the future of society but, rather, invites new choices. It is not inevitable that the new technology will merely strengthen the social order of advanced industrial capitalism; it surely carries with it the equal possibility of transforming that social order. However, in previous times when technological changes occurred at a slower pace and when social institutions (especially those concerned with the political order) were relatively stable, the kinds of choices open to those in positions of power were rather limited. It was taken for granted, for example, that work was a central activity (for all but a few) in industrial societies. But, if the 'collapse of work' is the major outcome of the new technology the very concept of work becomes problematic, having serious implications for the political cultures of the advanced industrial nations.

One central value, the Protestant Ethic, has become deeply embedded in advanced capitalist societies. Indeed, it has provided the framework for political thinking in all advanced industrial societies. Max Weber related this ethic of "...'proving' oneself before God..." to "...proving oneself before men..." in the context of the ethos of the bourgeois middle classes (1). As the
Protestant Ethic became generally known as the 'work ethic' it permeated the value system of all classes and all established political ideologies. Not least has it become taken for granted by those who work within the education systems of these societies. Yet the perpetuation of the work ethic in a world where work is rapidly disappearing is somewhat contradictory. It is noticeable, however, that contemporary programmes of 'vocational' training (i.e. training for the 'world of work' rather than for a specific occupation) have continued to promote the work ethic as an essential element in the flexible workforce of the future. Thus, young people in the advanced industrial societies are being told on the one hand that they should continue to adhere to norms of diligence and on the other that they should recognize that work as it is commonly understood may no longer exist.

More significantly, the issue of employment ceases to be seen in political terms but rather in an aspect of technology and management. Work is no longer the outcome of particular patterns of social organisation, of decision-making processes, or of a particular value system, rather it is the outcome of technical-managerial imperatives. Here, we see what is arguably one of the most significant consequences of technological change in contemporary advanced industrial societies: the reduction of political-moral issues to technical-managerial issues. It is, as Habermas suggests, the abandonment of '...the substance of power in favour of an efficient way of applying available techniques in the framework of strategies that are objectively called for' (2). In this way, political decisions are translated as technical decisions: they are purely 'objective', being taken on the grounds of efficiency. (It is, of course, interesting to note how post-war conservative and social-democratic governments in Western Europe have taken decisions allegedly on the grounds of efficiency rather than according to political ideology).

It will have become apparent by now that while I consider that scientific-technological change has had a fundamental effect upon the political cultures of the advanced industrial societies, I do not accept that this is the consequence of some 'technological imperative'. Issues of scientific-technology inevitably incorporate issues which are political and moral in nature. On the other hand, the way in which such issues are presented has tended to inhibit political debate, thus excluding discussion of such issues from the public realm. If debates about developments in scientific-technology are presented within a non-political, 'technicist' framework, where professional expertise is the sole criterion for understanding, then we may conclude that such debates, far from being 'objective' in character, are in fact quite ideologically
Based. To put it more precisely, technological change has ideological force because of the tendency to ignore its social and political implications.

In part, the presentation of technological change within a non-political framework has its roots in the 19th century belief in the inevitability of progress. This belief returned in the post-war era under the guise of the 'end of ideology' and the termination of political conflict heralded in the wake of rapid technological advance. At the same time there was a failure to recognize the institutional context of scientific 'progress', contributing to the legitimation of the existing framework of political power through a process of depoliticization. As Habermas has stated, questions of practice have become absorbed into questions of technology (questions, as previously stated, to which the answers can only be found by 'experts'). Thus, as politics, as understood within the parliamentary, liberal-democratic tradition, is excluded decision-making becomes a technical issue. Here, one view is that the advanced industrial societies of Western Europe and North America merely indulge in plebiscitary action every so often which requires little if any political awareness. Habermas once more points out that advanced capitalism, being dependent upon a 'depoliticized public realm', strongly resists"...that unrestricted communication about the goals of life activity and conduct..." which is necessary for the growth of political awareness (3).

What, then, are the consequences for the promotion of political awareness? If political education, as conventionally understood, is closely tied to the national political cultures of advanced industrial societies, it is unlikely to fulfil its goal in an era where scientific-technology has appeared to undermine the very basis of those cultures. The conservative model of political education, emphasising the importance of tradition, custom, and the attitudes associated with the prevailing political-economic system, is at best irrelevant and at worst a device for concealing the nature of contemporary society. Arguably, a more liberal model which emphasises the acquisition of knowledge, attitudes and skills associated with political activity in parliamentary democracies would be an improvement. However, this model also falls into the gap of isolating politics, of perceiving political education as concerned with the apparatus of government and elections.

I would therefore suggest an alternative approach: one which considers an examination of scientific-technology and its implications as a more meaningful contribution to the promotion of political awareness. This could be particularly significant at a time when there have been curricular changes affecting the
education of those at the upper secondary and post-compulsory levels. The emphasis on vocational education and training in an era of economic recession and youth unemployment has been felt throughout Western Europe. National governments have been in the forefront of initiating changes in educational practice, often stressing the importance of technological change and its effects on the job prospects of young people. It is no longer appropriate to continue with established modes of vocational training for they merely perpetuate a false view of reality, that jobs requiring the possession of traditional skills will eventually reappear. Technological change in the late 20th century means uncertainty and therefore demands training for flexibility; consequently, the notions of 'vocational preparation' and 'transferable skills' become paramount.

As increasing numbers of young people find themselves forced out of the labour market and back into the educational (or quasi-educational) system new opportunities for the promotion of political awareness might present themselves. Central to many programmes of vocational preparation is an appreciation of information technology and its applications, whether in the 'electronic office' or industrial automation. The extent to which such technological developments are examined in a detailed, critical manner remains to be judged; much depends on the structures within which vocational preparation takes place as well as on those who are the educators/trainers. Here, we are not only dealing with what might actually constitute technological education, i.e. whether it involves a non-positivistic perspective on science and a consideration of the political and economic implications, but also the proposition that educational/training institutions can operate in a relatively autonomous manner. Clearly, this would demand some kind of empirical approach, bearing in mind the diversity of education systems in the advanced industrial societies.

Central to this discussion has been the notion of technological determinism. Its acceptance suggests that in the final analysis scientific-technology is a mystery and, therefore, outside the control and understanding of individuals. While it may appear that post-war technological change in the advanced industrial world has increasingly been seen to determine social, political and economic changes, I would argue that the picture, in reality, is rather different. A more accurate view would be that technological change takes place within a complex web of interaction in which dominant ideologies, economic forces, and scientific-technological practice are all significant. It may be that the increasing domination of 'new' technology reflects an increased propensity for centralised social control; it may certainly make it easier. On
the other hand, until developments in artificial intelligence result in complete machine autonomy we cannot, in truth, give primacy to technology. In which case, those who teach in the fields of science and technology, and especially those who are increasingly involved with vocational training and education, might find themselves able to perform a vital role. The role is that of political educator — not in the sense of being the teacher of civic virtues or of political skills — but of helping to de-mystify technology and to lay bare the underlying values, beliefs, and power structures.

Notes

3. ibid. p. 120.