
THE POLITICS OF ARTEFACTS

PROLOGUE

Over the past 40 years or so, Sociology and the disciplines and professions concerned with digital technologies have enjoyed a somewhat complex relationship. If we disregard their burgeoning role in the practice of Sociology itself (and this story does deserve to be told) and admittedly at the risk of some simplification, broadly we can discern two streams. As technological innovations, digital technologies have been the object of much fascination and study. The approaches adopted and the interests taken have been drawn from the body of work associated with the Sociology of Science and Technology.⁴² Separate but related to this stream has been a concern with the design, development, implementation and roll-out of products utilising digital technology. This latter interest has its origins in work such as Enid Mumford's ETHICS approach (Mumford 1995) to participative design⁴³ as well as later ethnographic studies of the workplace such as those of Lucy Suchman and her colleagues (Suchman 1987). Fields such as Computer Support for Co-operative Work and Human Computer Interaction have both tried to incorporate sociological findings in design.

Whilst the studies *of* technology and the studies *for* design have intersected at many points, of late a new nexus seems to be emerging. This is around the political and ethical implications of digital technologies on our ordinary lives.⁴⁴ Whereas studies of technology identified the social forces which shape the ways digital technologies emerge and progress to product and the studies for design sought ways to improve the effectiveness of the product within the context of use, this new concern seeks to use findings of studies of technology to influence design itself. It seeks not just the practice of Sociology as a complement to design but also the incorporation of sociologising in design. Because of their understanding of the social and ethical consequences of innovation, it is argued that sociologists should be brought in as members of design teams in order to help designers avoid designing technologies which will have deleterious consequences.

In this essay and the next, we consider this proposal. Whilst we understand what motivates it, we are less than convinced first that the case for it is made, and second, if implemented, it would be viable. Neither of which, of

⁴² Though some exceptions, as such they have largely avoided the confusions and muddles we have discussed in other essays in this book.

⁴³ Enid Mumford's legacy appears to be largely lost to-day. Her work is very rarely referred to. This is a pity as her application of the Tavistock Institution's theorising of organisations did actually grapple with (and to some extent resolve) many of the problems which preoccupy contemporary debates.

⁴⁴ One aspect of this has been the introduction of the topic of digital technologies into Cultural Sociology. We discussed this in the previous essay. What we focus on here is the exporting of Sociology into design as the basis for political and ethical judgements. In that sense, our interests here are more akin to those we expressed with regard to ANT and Economics than they are with the ones we expressed concerning Cultural Sociology.

course, should be taken to imply that we do not think digital technologies set us ethical conundrums. They clearly do. Our fear is that some of the approaches to these problems, and especially Disclosive Ethics, may create more problems than they solve. In Essay 8, we explain why we have come to this view by considering the arguments of two major advocates of Disclosive Ethics, Philip Brey and Lucas Introna. Whilst there are many similarities between their positions, they differ in quite fundamental ways. Both are heavily dependent on arguments made in Langdon Winner's paper *Do Artefacts Have Politics?* (Winner 1985) and so in the current essay we consider that discussion in some depth. To begin with, though, since Winner, Brey and Introna want to call up sociological or sociological-like arguments in support of the cases they make, we will set out some considerations with regard to the practice of sociological theory and research which we feel bear upon the whole debate. These considerations will surface again and again in our discussion of Winner, Brey and Introna.

A WORD TO the WISE

Digital technologies are now critical to our way of life. Not only are they to be found everywhere, they are in everything. Their ubiquity and pervasiveness was the characteristic which encouraged some to describe modern life as an information society (Castells 2001, Baudrillard 1995). With this dependence has come concern (van Den Hoven & Weckert 2008). Just what are these technologies being used for? And are such uses always ones which we are content to tolerate? These are important questions. Questions of what is right and wrong in the use and application of digital technologies are ones which we as a society must address. Moreover, as sociologists, we are pleased to see sociological findings and arguments valued enough to be drawn into these debates by philosophers and others who seek to resolve the dilemmas and conundrums they set.

However, this use of Sociology has to be a careful one. Sociological accounts and research can appear disarmingly simple to the unwary when beneath the surface all sorts of complications and difficulties lie. Such complications and difficulties make up *the culture* of the discipline, if you like; what is known about but rarely commented on in the hurly burly of practising it.

Our purpose is to surface some of this culture so those who want to call upon Sociology as part of the engagement with the political and ethical issues set by digital technologies, can do so confident they know just what they are relying upon; just what Sociology can and will give them, and what it will not. Our hope is that Cervantes' adage will once again prove sound : "Good wits jump; a word to the wise is enough".

THE UNRESOLVED NATURE OF CORE PROBLEMS

Whilst it is true that there are many unresolved problems in the Natural and Mathematical Sciences, for the most part those who work in the respective fields know what it would take to resolve them. It is just that the theory has not been well enough developed, the experiment cannot be designed, or the data is not amenable to capture with the instruments we have at the moment. With the social sciences, and Sociology in particular, the situation is quite different. Despite endless re-workings of the same materials, we appear no closer to knowing just what would resolve a number of core problems to the satisfaction of all. From where we stand now, the problems look less unresolved than unresolvable.

Which problems do we have in mind? We will nominate just three, all of which bear in one way or another upon social and ethical implications of digital technologies.

1. Technological Determinism: Is the proposal that technological development is the prime mover in socio-economic change viable? Associated with this is another oft debated question. If technological determinism is not a defensible position, does that mean Marx's account of the evolution of Capitalism is flawed because it is technological determinist? The positions on these two are myriad with much debating art going into teasing out highly

nuanced distinctions which can be defended. So we find scholars such as G. A. Cohen (1979) staunchly claiming both that Marx was a technological determinist and that *there is nothing wrong with that*. Others such as Andrew Feenberg (2002) want to save Marx from his interpreters and, by judicious adjustment, construct a different Marxian and critical theory of technology development. Feenberg's account draws upon approaches to socio-economic change which posit a mutual interdependence between technology form and social structures and which, therefore, reject technological determinism. Despite all the discussion, we are no closer to a firm consensus first, on whether technological determinism is a viable sociological account, and second even whether Marx was a technological determinist, not least because it is by no means clear or agreed just what technological determinism is committed to.

2. The origins of Possessive Individualism. It is generally accepted that early modern society emerged first in late medieval England. It is here that the combination of legal, political, social and economic structures which transformed itself into modern society can first be discerned. This transformation is usually held to be from a peasant-based feudal society to a class-based capitalist society; a change labelled 'The Great Transition'. At the heart of this transition is the replacement of a value system which gave priority to collective and communal bonds by one which stressed the rights and obligations of the individual: in particular the rights of the individual to alienate, hold and dispose of property. Possessive Individualism characterises modernity (MacPherson 1962). The debate over the origins of this value system continues to this day. Are they to be found in radical religious views which culminated in Puritanism (e.g. Weber 1930)? Are they to be found in the forces driving the increased commercialisation of agriculture needed to feed a burgeoning population (e.g. Homans 1930)? Or, is it perhaps the case that, as Alan Macfarlane (1978) has argued, if a peasant society is to be characterised by the absence of Possessive Individualism, England never was a peasant society and so, at least in the leading case, we should stop talking of a major transition. As much historical evidence as is heaped up on one side of this multi-sided debate is matched by the evidence heaped up on other sides. Indeed, *the same* evidence often is offered to support diametrically opposed arguments. Finally, when invoking these arguments, we should remember that much of the evidence usually offered bears only marginally on the cases that are being made.
3. Nature and Nurture: Although few to-day are prepared to argue that 'biology is destiny' (or the inverse), nonetheless the precise weighting to be given to inherited traits as compared to culturally learned behaviour in the explanation of particular aspects of social life remains unresolved (Pinker 2004). Despite all the studies of educational attainment, criminal behaviour, attitudes to work, voting patterns, and so on, we are still no closer to saying how much of any of these can be accounted for by genetic and natural forces and how much by social and cultural ones. In fact, one characteristic feature of these discussions is that the protagonists start from the position where they *know* what the answer is and so their reading of the evidence is in service of their pre-supposition.

What does all this mean? Well, apart from indicating that for anyone to be able to claim literacy in the field, serious training in Sociology should include examination of the original classical as well as contemporary explanations of these issues, it means that in order to pursue their research, researchers have to take positions. One simply cannot make any headway if one is always stymied at the start by indecision over how to frame the research question. Obviously it is good for students and novice researchers to understand that there are many different ways the question can be taken, but to do any work, you have to take the question some particular way. This is not a deliberate denial of the debates, rather the practical requirement of doing practical work. So, very often it will appear from the way the research is framed and how the facts of the

matter are presented that some debate, issue, bone of contention has been resolved. But this is usually simply a device for curtailing argument in order to get on with presenting the research. Things appear to be settled and agreed, when in reality either the debate still rages or it has cooled and been left unresolved. All that has happened is that the researcher concerned has simply made his or her own mind up and proceeded from there. The implication of all this is that we should be just a little suspicious of claims about what Sociology has or has not done as well as about what prior forms of Sociology could and could not do.

In Sociology, many, perhaps all, of the central and critical issues around which the discipline is gathered remain highly contested. However, rather than constantly engage in a debate over fundamentals and starting points, researchers choose a position and then shape their work from there. As a consequence, the unwary, coming across sociological accounts of phenomena which catch their interest, need to be more than a little cautious with confident appearing assertions of fact and settled agreement.

THE POINT OF SOCIOLOGY

The second fundamental issue we want to highlight concerns what might be thought of as the point of Sociology. Of course, everyone says that their aim is to explain the nature of social life, but what is meant by that takes two very different forms. One the one hand, scholars seek to provide narratives laying out, or explicating, the *causal ordering* of pre-conditions and effects which lead to particular social forms and patterns of behaviour. The debates in socio-economic history on the Great Transition are a prototypical example of this, as are the various debates over patterns of educational attainment, voting patterns, relative social mobility and the like.

On the other hand, much of Sociology (and perhaps all of popular contemporary theory) seeks to explain *the meaning or significance* of such patterns and outcomes. Why are they important and what role do they play in the overall structure of society? Thus, what is being explained are the reasons why such patterns persist and their relationships to other, often overdetermining structures.

This difference is crucial for how evidence is marshalled and deployed. The approaches differ in fundamental ways though both see the deployment of evidence as critical. Whereas the colligation of examples, conditions and effects can be thought of as loosely conforming to an inductive approach to explanation, the examination of the meaning of social patterns proceeds on a *post hoc, propter hoc* basis, with the analyst knowing in advance what the account of the phenomenon is to be. What is arrived at by this approach, then, is repetitive *confirmation* of an antecedent theoretical position rather than cumulative *discovery* of social patterns.

When considering and evaluating a proposition such as "artefacts have politics" (the central assertion in discussions of ethics and information technology), it is crucial to be clear first whether this statement is the summary of a discovery process or the reiteration of an antecedent position, and second what evidence is being used to support it and how. Sorting these matters out is, we will accept, sometimes extremely difficult, especially for those who are not necessarily *au fait* with the intricacies of sociological reasoning. This situation is not helped when those concerned to elucidate the significance of a social practice talk as if they are describing its causes. As we have argued in previous essays, this is precisely the case with those who want to draw on Critical Theory or "post-humanist" versions of Actor Network Theory to offer accounts of digital technologies (for example Hofkirchner (2007), Latour (2002)).

THE CENTRALITY OF LEADING EXAMPLES

Perhaps because so much sociology is learned through absorption of textbook expositions rather than engagement with original studies, summaries of positions and arguments in the research literature tend to depend on a few, often only one or two and generally the same one or two, leading examples. Apart from the medieval English peasantry and its role in The Great Transition (see above), one has only to think of the role of

Shawnee linguistic forms in justifying the Sapir-Whorf hypothesis, or the stories told to Margaret Mead by Samoan adolescent girls with regard to theories of the cultural relativity of adolescence.

Equally importantly, many times the claims made on behalf of the examples are made *as if* there is no doubt that the research did demonstrate the case being made. But, as is brought out *par excellence* by Augustine Brannigan (2004), such a presumption may be mistaken. Often the research record contains long standing and serious reservations about the findings though these may not be so publicly advertised. Such reservations which mostly start from the fact that the evidence provided by the original example was not as conclusive as it was initially made out to be.⁴⁵

Finally, the lack of attention to original studies often means that the use of the arguments that these cases are said to support resembles Chinese Whispers, to use Joerges (1999) phrase. Exemplary cases become enshrined without any calibration of what is now being claimed on their behalf against what the original example claimed to show. As a consequence, all too often invocational drift takes place, with the original example and the current claim bearing only a distant resemblance to each other.

In short, it is wise to be careful when using what appear to be standard examples drawn from the sociological research literature, particularly if they have iconic status. All too often, the example will not bear close inspection, let alone the weight it is being asked to carry.

THE PREDOMINANCE OF FUNCTIONAL ANALYSIS

As with the rest of Sociology, the majority of sociological studies of science and technology seek to expose the significance of scientific and technological practice (e.g. Pickering 1995. Barnes & Edge 1982). In this context, exposing significance is usually taken to mean showing that things are not necessarily to be taken as they are described by those engaged in those pursuits. In particular, emphasis is often placed upon the importance of social interests and other factors in determining research outcomes. So, for example, social forces are said to determine the evolution of scientific theory and the dynamics of technological innovation.

The argument used in such studies is *functional* in form. Functional arguments have some distinctive properties which it is as well to bear in mind. We will summarise just four.

1. For some set of circumstances or outcomes to be a functional consequence of a social practice, the circumstances must be *both logically and empirically distinct* from the practice. If there is no logical distinction then the practice and consequences are identical. If there is no empirical distinction, there are no grounds on which to base a description of how the practice gives rise to the consequence.
2. Evidence is central to the *plausibility structure* of all sociological account. Evidence which underpins the strength of a functional analysis demonstrates the degree of close coupling between the practice and the consequence on the one hand, and the consequence and overall system stability on the other. What makes a functional description convincing is, quite simply, the strength of the story that such evidence tells. This means that, unlike Achilles' view of Logic in Lewis Carroll's parable, a functional analysis cannot take you by the throat and force acceptance. No matter how convincing the description, there is always another way the story can be told, another narrative which can be played out, another interpretation constructed. This, more or less, is the central reason why sociological debates seem so non-convergent.
3. It is *an axiom* of functional analysis that all social systems self regulate to achieve cohesion, integration and stability. Even in the face of deep structural and disintegrative forces, adaptive processes are at work. Key among these are shared systems of norms and values. The

⁴⁵ See Lucy (1997) on Sapir-Whorf and Derek Freeman (1983) on Mead. We have already discussed the debates over the Great Transition.

introduction of new social practices, for example social networking via the World Wide Web or the use of CCTV, may well bring changes in norms and values but these changes will take place in the context of overall stability.⁴⁶ Furthermore, as they become "institutionalised" or embedded as social practices, they too will contribute to overall adaption but under somewhat changed conditions which come about partly a consequence of themselves. In this way, changes in norms and values are, or can be, functional consequences of new social practices.

In many ways, one could argue that Sociology's main contribution to the study of social life has been functional analysis. Certainly, anything passing for Grand Theory tends to be functional in form not least because genuine specification of causal relations is almost infeasible in Sociology. What this means is that any research endeavour operating within a standard or classical theoretical tradition, even one that seeks to integrate whatever modish oppositions happen to be *au courant*, is likely to be offering support for functional explanations. There is, of course, nothing wrong with this except in so far as the explanation does not make a clear distinction between its own operative procedure (namely rationalising back from outcomes) and that more usual in causal analysis. Making such a distinction is critical lest the former be taken for the latter and hence functional descriptions of a social practice be construed as causal accounts of how things are. Such a misapprehension, or so we would argue, is central to some prominent discussions of the impact and importance of digital technologies.

Let us now return to our original purpose. In setting out the considerations above, we do not mean to belittle or disparage Sociology, especially to those who would like to use its findings to help understand the ethical implications of digital technologies. We believe sociological analysis should be insightful and could have lots to offer such debates. However, to repeat our introductory caveat: sociological investigations and their findings can look disarmingly straightforward when, in fact, they are not. It is, therefore, important to understand the trailing clouds of open questions, analytic stipulations, and methodological pre-suppositions with which they come. For if one does not, there is a serious chance that the Sociology taken up will be felt to be more secure and resilient than it actually is. In all probability, the resulting philosophical, ethical, professional and policy structures will be like the house of the biblical foolish man — built on sand with all of the unhappy consequences that followed. Using leading discussions of the ethical implications of new technology, in this and the next essay we illustrate just how this can happen.

THE GENERATION OF AN URBAN MYTH⁴⁷

In debates over the ethical and political implications of new technologies, Langdon Winner's (1985) discussion of the bridges of New York and the evidence offered for the conclusion that artefacts have politics has an iconic status. The case he makes is taken to be a complete demonstration that artefacts do have politics. It functions almost as a totem in every subsequent discussion in that it is repeated or referenced without reflection.

However, we feel, that a number of serious questions should be asked before accepting the argument Winner makes. These questions derive from the style of sociological analysis Winner relies on. Our aim is not to debunk Winner (well, not entirely!) but to raise issues which those who wish to use Sociology to aid careful consideration of the ethical, political and other value dimensions of technology, especially digital technologies, might like to reflect on. If the Winner case is not as secure as is usually thought, what does this imply for arguments about ethics and technology premised on it?

⁴⁶ Those who think this is denied by Marxist Sociology might want to reflect on Marx's analysis of The German Ideology (Marx & Engels 1938) and Marcuse's (1964) notion of "repressive tolerance" or by Cohen (op cit) and Jon Elster (1986) both of whom argue that Marx offered functionalist arguments. The cases made by Cohen and Elster are, of course, disputed, but that is our point. Everything in Sociology is disputed.

⁴⁷ In using this phrase we are following Steve Woolgar's lead. See Woolgar & Cooper (1999)

To begin with, both as a way of ensuring a common base and to assist those who might not be so familiar with Winner's paper, we will summarise his key arguments.

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The objective Winner sets himself is to find a path between accounts of technology which insist it is neutral with regard to the effects it has and accounts which insist, on the contrary, that such effects are determined by the social and economic environment within which the technological innovation is placed. The former want to say that it is how technology is used which gives it whatever political form it might have.⁴⁸ The latter want to say that, no matter how distinctive the technology is, its political form will reflect the dominant social forces.⁴⁹ In opposition to both these views, Winner argues that the technologies do count: they do have effects because of the way *they are* and not simply because of the environment they are in. He identifies two types of "politics" technologies can have. The first he calls "forms of order"; the second he calls "inherently political", by which he means they predispose certain patterns of power and authority.

The design of the New York bridges is of the first kind. According to Winner, Robert Moses who was responsible for the design of public works for New York at the time, deliberately set the height of bridges on the parkways that were being built so as to prohibit buses (the predominant form of transport for the low income, mainly black population) using them. This had the effect of preventing this section of the community from accessing the beaches of Long Island, and in particular, Jones Beach which was popular with the white middle classes. The social consequence of a particular technological solution was to reinforce class and ethnic discrimination and inequality.

For the second kind of politics, Winner suggests that choosing to develop and deploy certain kinds of technology is to choose a "a particular form of political life" (p 31). What he means by this is that consequences are not specific outcomes but rather the tenor, form of authority and decision-making they require. The example he chooses is nuclear power but he believes the phenomenon is more general and perhaps even typical of advanced industrial nations, characterised as they are by large-scale institutions and organisational processes. The centralised decision making processes (usually described as 'command and control') which modern organisations display are, or so Winner wants us to accept, the antithesis of open democracy. It is not surprising, therefore, that the arrangements surrounding the deployment of nuclear power have been structured in this command and control form. To put it more crudely, but we feel not unfairly, for Winner, nuclear power is predisposed to authoritarianism. And we can expect the erosion of civil liberties and other features of authoritarianism in the name of exigency to follow where the management of nuclear power is concerned.

The two types of political effects which Winner distinguishes are very different. As a consequence, we will take each in turn.

TECHNOLOGIES AS FORMS OF ORDER

The central question is whether Winner's account of the New York bridges actually demonstrates that they are indeed political. Let us grant, for the moment, that Winner is right and that Robert Moses did deliberately fix the bridge height to prevent sections of the community accessing Jones Beach and other parts of Long Island.⁵⁰ That act of setting the bridge height with the intention of excluding certain groups is, clearly, 'political' in some recognisable sense. Moses wants to maintain some kind of social divisions. But how does that motivation on the part of Moses get transferred to the bridges? Since (we assume) no-one is going to argue that the bridges want to exclude certain groups from Long Island, all we can say is that Moses was using the

⁴⁸ Although Winner identifies this as a commonly held position, he identifies no one with it. The only case we can find of anyone actually defending such instrumentalism is the attribution by Marshall McLuhan of it to David Sarnoff (McLuhan. 1964, p 2)

⁴⁹ This is by far the most common sociological position. See the other papers in Mackenzie & Wacjman (1985)

⁵⁰ As Woolgar and Cooper (1999) make clear, this is not necessarily a secure assumption.

bridges to achieve *his* ends. The ends, and let us agree, again for the moment, they are political, are Robert Moses' not the bridges'. That might seem blindingly obvious but it implies that the bridges cannot be viewed as *political themselves*. The bridges are neither acting nor refraining from acting to achieve any ends. They are, at least as Winner tells the story, the instruments of Robert Moses' politics; a familiar enough tale told about technology. But, and this is the critical point, this account of technology is precisely one of the standard positions from which Winner wants to distinguish his own. As such, Winner's account fails to deliver his own objective and show that technology (the bridges) do have their own politics.

So much for Winner's objective. What about Robert Moses' objective? Does Winner show that, through the bridges, Moses succeeded in reinforcing segregation and social class? Or simply that such an outcome was his intention? In this respect, the bridges example is subtly different from the second example Winner cites in this part of his discussion, namely the introduction of a particular type of casting machine in the McCormick factories in Chicago. This was done as a deliberate and successful strategy to replace skilled and highly unionised labour force with unskilled and non-unionised one. There appears to be no question but that this strategy worked. After some time, unionised labour had disappeared from the McCormick work force. The union records are evidence that this happened. This is not surprising since all the enablers for it were within the control of the factory owners.

With the bridges, though, what evidence is there to show the purported strategy worked? We might say that it stands to reason that it would, but its standing to reason is not any kind of *evidence* that secures the case. The difference between the two examples turns on the scope and location of the consequence and the evidence for it. The machine tool case is limited to a factory and the composition of its labour force, for which evidence is relatively easy to obtain. The bridges case is a broad societal consequence affecting a large, perhaps the major part, of the population. No doubt the claim might have been secured had it been buttressed by studies of the use of the highway and beaches and the effects of the parkways as 'pinch points' in accessing Long Island. This would require comparison of the parkways as access routes against other access routes that remained available. It would also require comparison of the use the beaches by different communities and the likely reasons for it.

None of this is offered. Instead, Winner suggests that the designer of the bridges wanted them to have a particular social effect; to operate as a form of order. But unless we are using the term 'political' as a way of judging artefacts independent of their effects, without an examination of their efficacy in achieving the intended outcome, this can hardly be said to be a demonstration that they are *political in their effects* and hence political at all. The most one can say, it seems, is that Winner alleges the bridges are the instruments of Robert Moses' political beliefs.

So, the argument that the bridges were political is, to say the least, weak. What about the suggestion that they were deliberately designed to have the effects which Winner attributes to them? In a detailed review of the whole example, Bernward Joerges (1999) offers a number of considerations well worth taking noting.

1. The whole story (Joerges calls it "a parable") depends upon two interviewees whom Winner quotes from Robert Caro's biography of Moses. No other corroborative evidence is cited or seems to exist. These interviewees *attribute* the discriminatory motive as their rationalisation of the designs that Moses authorised. Ultimately, the 'factuality' of Moses intending to use the bridges to reinforce segregation rests upon the surmises of these two people. These surmises are the only evidence offered.
2. As against these inferences, Joerges points out that the design of the parkways was part of a regional transport plan. They were to provide a rapid, free flowing access route to particular destinations. However, *they were not the only routes*. The supposed excluded groups could and did get to Long Island by other means. That they didn't go to Jones Beach, or didn't go in

numbers, can quite easily be understood in terms of what we know about US society at that time. This was a society riven by social, especially ethnic, divisions. Why would such groups have wanted to go to places where they would not be welcomed and in all likelihood (very) actively discouraged from staying? It does not take much reflection or insight to light upon plenty of *contextual reasons* why the beaches of Long Island may have been used the way Winner suggests they were.

3. Moses may or may not have held much the same beliefs as his white middle class peers about race, class or anything else. In all probability he did, but we don't actually know. His beliefs only matter if the choice of bridge height can unequivocally be seen to have been motivated by political ends. Joerges produces (p.10) two quite straightforward reasons of his own for why the bridges are so low; reasons, he says, which have been suggested to him by US civil engineers. First, commercial traffic, therefore including buses, was prohibited from using the parkways. This was not a local policy but a national one. There was, therefore, no design requirement to raise the bridges to accommodate buses. Given the very good transport system in the region, the buses had alternative routes available to them and did not need to use the parkways. In addition, without a design requirement, the increased cost of building to a greater height would have been unjustifiable.

In other words, there were simple project engineering reasons why the bridges are so low.

4. To the above, Joerges adds his own speculation. Moses had two lifelong pre-occupations; the need to accommodate the motor car within urban design; and the value of environmentally sensitive design. In prioritising motor car traffic, Moses was following the first. In keeping the bridges as low as possible in order to meld into the urban landscape, he was following the second. This might be a speculation of Joerges part, but it is no less a speculation than the opinions offered by the two interviewees Caro quotes and Winner takes as evidence for the discriminatory nature of the bridge design.

It would seem, then, all the components of Winner's argument that the bridges of New York have politics are less than secure. First, as told by Winner, the story of the bridges is actually one of their instrumental use by Moses rather than of their having their own politics. Second, no evidence is provided that the design of the bridges did have politically divisive effects. The segregation of beaches on Long Island was much more likely to be the result of endemic cultural and socio-political forces. Third, no evidence is offered to show they were actually designed to have such an outcome, and plenty of reasonable grounds for suggesting they would have been designed the way they were no matter who was responsible for them. In sum, the whole story is little more than an urban myth.

But what of Winner's other argument, namely that technologies are inherently political?

INHERENTLY POLITICAL TECHNOLOGIES

With his second category of technological politics Winner might have inaugurated an empirical research programme. No doubt in some circumstances and for some forms of technology, his view would be vindicated. Once we have an array of studies which demonstrate that as particular technologies evolve within our society, their associated decision processes anneal into authoritarian or other modes, then we will have evidence that, at least *for those cases and under those circumstances*, technologies have politics. However, making this case cannot be done by starting from the presumption that all technologies must have a politics, finding rationalisations for why that claim can be sustained in particular cases, *and then* claiming this proves technologies have politics. And yet that is exactly how, at least in the case of nuclear power, Winner proceeds.

What Winner is struggling with here, of course, is the wish to broaden the conception of the political, and hence the study of politics, beyond formal political institutions, but without at the same time fragmenting the

sense of the political which we associate with those institutions. Within the formal institutions, we know what we mean when we say that every action and every feature "is political". Winner wants to take this understanding and attach it to things outside formal political processes. For social scientists, both formal politics and non-formal politics constitute "the political culture". Social science theory says that both are held together and glued to each other by the centripetal forces of dominant interests. The politics of technologies is just one aspect of this. Seen from this vantage point, Winner's view is all of a piece with standard functionalist descriptions of political life offered by sociologists as varied as Peter Worsley and Steven Lukes. Worsley (1973) points out that formal political activity is but a sub-set of the political activities in a society. Whenever we try to ensure others act in ways that make ends we value more likely, we act politically. These actions can be within formal governmental structures, formal and informal organisations (both of which constitute what Worsley calls Politics 2) or within the flow of ordinary personal interaction (what Worsley calls Politics 1). In like manner, Lukes (1974) wants to broaden the conception of power, and therefore the exercise of power, to the variety of ways in which political agendas and values are implicitly prioritised and legitimated within society. This is what he calls "the third dimension" of power. Both are offering what are clearly *functional* views of politics utilising *post hoc propter hoc* arguments: views which assume there are political consequences to every aspects of our lives and, moreover, that such consequences serve to reinforce current forms of domination.

In sum, any innovation or novel social practice will be introduced into a context of institutions and practices, what we can call the local and global social structure. As it gains in popularity and use, it helps to re-shape and hence change this structure. To be successful, though, the innovation must both sustain and amend the extant value system. It is this which makes it political. But because this applies across the whole of social life, as Worsley says, everything is political. To say that technologies are political is to say no more than under some very specific sociological description or interpretation, technologies play a role in the political culture. That is, they are political by definition.

ARE TECHNOLOGIES POLITICAL?

What, then, are we to make of Langdon Winner's famous assertion of that technologies have politics? We have seen that the first sense he attaches to this claim has a very shaky basis. The core example, the design of the bridges of New York's parkways, is a tale that has grown in the telling and re-telling. As Bernward Joerges puts it, its current status owes more to the practice of Chinese Whispers in research referencing than anything else. In the second case, what we have is the replay of standard functionalist political sociology to demonstrate the adaptive processes of the political culture. In other words, if we take the assertion to be an empirical generalisation, either it is unsubstantiated (in the first case) or it is old hat (in the second).

Of course, it might be that that the assertion was never meant to be an empirical generalisation at all, but rather a call to arms. In his review, Joerges is clear that he thinks this really what is going on. In an interview with Joerges which he quotes (p 15), Winner states quite categorically:

I am not interested in theories, I am interested in moral issues. My point is not explanatory, it is about political choices.

In other words, Winner's intent is to start a political argument about the place and power of technology in society and how that can be changed, not to provide a disinterested evidenced-based analysis of either the social causes and effects or functional consequences of technological innovation.

That being the case, the bridges of New York do turn out to have a politics, but this time they are Langdon Winner's politics not Robert Moses', let alone their own. The bridges have a place as a rhetorical device in the morality tale Winner wants us to be convinced by. Winner wants us to believe that technologies have politics so that we will be more likely to support the case for change in the power relations surrounding them.

Winner's intention is made startling clear in another essay, this time on the nuclear power facility at Diablo Canyon in California.

More and more the whole language used to talk about technology and social policy....smacks of betrayal. The excruciating subtleties of measurement and modelling mask embarrassing shortcomings in human judgement. We have become careful with numbers, callous with everything else. Our methodological rigor is becoming spiritual rigor mortis. (Winner 1989, p. 176)

In making his arguments, Winner doesn't start with artefacts and find politics: he starts with politics and, after searching around for a clinching case, ends up with the artefacts he describes.

WHY DOES ALL THIS MATTER?

First, of course, it matters to get the record straight. Whatever one might think of mid-20th century New York urban planning, it is important to ensure that those who were involved in it are not pilloried; or at least, not pilloried for the wrong reason. Second, it also matters because Langdon Winner's paper and the New York bridges example, in particular, have such wide currency. It has become an article of faith that the story as retold by Winner is a fair and accurate account of what went on. Each telling of the tale reaffirms this and thus stands as proof of the justification of Winner's assertion. Finally, and probably most importantly, the case has become the anchor bolt both for further studies and for the analyses based upon them. These analyses have led to calls for interventions within design processes both at the curricular and at the operational level. Such interventions are proposed in order to ensure that the case of the New York bridges could not be repeated. Political and moral philosophers, professional engineers and others have joined together to try to formulate programmes of study and professional practice precisely to ensure that, as far as is possible, artefacts can be shorn of their politics. But, if the key case that all these arguments rely on, cannot be sustained, what then?

Langdon Winner has created a chimera out of the bridges of New York and, unsuspecting of its mythical status, many others have found it elsewhere too. In our view it is time we stopped pursuing this imaginary *bête noir* and began instead to think carefully, systematically and thoroughly about the social, political and ethical challenges which technological innovation actually does set us. In particular, since we might well be satisfied that some artefacts do have politics in the sense that Winner suggests, by so doing we might be able to determine *which* artefacts have *what* politics. Using a broad definition of politics might allow us to say that all artefacts have politics, but that in itself hardly in itself advances the capacity to determine the politics a given artefact actually has.