

The contributors to this volume share a commitment to the heterogeneity of social and technical relations. They are also committed to the view that sociotechnical change should be seen as contingent, and that it is, at least in part, a product of mixed strategies. But these commitments raise a series of questions. One of these is the question about where (or how) society ends and technology starts. How, if at all, can we disintinguish between the two? On this question there is less agreement.

We consider a number of possibilities more fully in the conclusion. Overall, however, it is possible to distinguish two approaches to the problem. One of these is what we might call the *interactive view*—a position characterized by three points. First, it is assumed that there is, indeed, a fairly stable and matter-of-fact division between the social and the technical. Second, it is assumed that the social shapes the technical. And third, it is reciprocally assumed that the technical is also capable of shaping the social. This view avoids the reductionisms of either social or technological determinism by arguing the case for interaction and exchange between the two. In this volume the authors who come closest to this view are, perhaps, Misa, de la Bruhèze, and Carlson.

However, there is a second and more radical approach—let us call it the *seamless web view*. This resists the notion that the division between the social and the technical is either stable or matter-of-fact. To say this is not, of course, to deny that it is possible to point at, and distinguish between, machines and those who operate them. Rather it is suggested that this distinction should be seen as an accomplishment, rather than something that can be taken for granted. Accordingly, it is argued that analysis should start with a seamless web of elements and look to see how that seamless web is broken up under different kinds of circumstances to create different *kinds* of objects. This seamless web approach is counterintuitive, but it is well represented in this volume. Notions like technological frame and actor-network, together with Bowker's study of Schlumberger, all assume that the social and the technical are constituted and distinguished in one movement—though this assumption is perhaps most fully developed in Bowker's paper.

But if sociotechnology is indeed a seamless web, then what kind of a vocabulary should we use in our analyses? The problem, as we indicated in the introduction, is that the language of common sense pushes us to talk of “technology” or “society”—as we have, for instance, above. It naturalizes the very distinctions that should be avoided by building them into the analysis instead of treating them

as an object of study in their own right. This is the huge problem that Akrich and Latour seek to tackle. Indeed, their two papers, together with their joint “Summary,” are best treated as a single piece. Their object is to press the merits of an evenhanded, relational semiotic language—one that allows them to escape the traps of common sense set by everyday speech.

Akrich uses this language to trace—in a way that resonates with several of the contributions in earlier sections—the manner in which the boundaries between the inside and the outside of sociotechnologies are delineated and thereby constitute what we commonsensically call technical artifacts and social actors. She exemplifies this with a series of studies of Third World electrification to illustrate the relationship between sociotechnical stabilization and the definition and distribution of attributions of agency and artifact. Thus, in the case of the electricity supply to Abidjan, she considers the various ways in which competences and moral attributions are distributed to different actors, human and nonhuman. The definition and formation of consumers, agents of the utility company, and electricity meters—each of these interactively plays a role in the process of stabilizing the network in question.

Latour has a similar concern with the distribution of competences between human and nonhuman actors. His first (deceptively simple) case is that of a door—its hinges, its operator, and its functions. He shows how tasks around the door may be delegated either to human or nonhuman actors—for instance, to a janitor or a mechanical “groom”—and explores the implications of these processes of delegation for others that interact with the door. He goes on to press the principle of generalized symmetry—the idea that agents and objects should be treated in the same terms—by exploring anthropomorphism in accounts of nonhuman actors and technomorphism in accounts of human actors. Finally, he considers the question of sociotechnical durability by distinguishing between the “programs” and the “antiprograms” that constitute and operate different versions of order in the semiotic seamless web.

If Akrich and Latour press a specific, symmetrical vocabulary for talking of and describing the seamless web of sociotechnology, then the paper by Pinch, Ashmore, and Mulkay leads us in another direction. Many recent studies have avoided a specific definition of technology—a matter that is considered head-on by these authors. First, drawing on a case study of health economics, they talk of what they call “social technologies”—procedures or methods of all kinds

that have primarily to do with the engineering of social rather than technical relations.

Second, again drawing on their case study, they consider the rhetoric of technological formation—how it is that technologies come to be defined, tested, and evaluated. Here there are resonances with the work of Akrich and Latour, for the authors consider technology as a text and treat its rhetoric as a method by which the latter may gain persuasiveness and so stability. Their chapter considers the way in which two quite different rhetorics were deployed by protagonists of clinical budgeting in the U.K. National Health Service. Strong rhetoric, used primarily in discussions with economists, managers, and (market-oriented) politicians, defined and defended such budgeting as an effective tool for economic efficiency. The second “weak program” presented clinical budgeting as a user-friendly tool that would allow doctors to make decisions more effectively. Pinch, Ashmore, and Mulkay show that the protagonists of clinical budgeting switched strategically between the two repertoires—a process that traded on a distinction between “inside” and “outside” and by virtue of that fact tended to legitimate and so stabilize clinical budgeting.

Finally, the authors turn the spotlight on themselves. If health economists switch between rhetorical methods to legitimate their practice, then what implications does this have for the social analysis of technology? First, the authors note that their own accounts of clinical budgeting are not very different from those of the practitioners. For instance, in an earlier paper they characterized the two repertoires mentioned above as mutually incompatible. Thus *any* account of health economics—their own included—is just that, account that operates to stabilize or undermine the status of clinical budgeting as a social technology. But the point may be generalized. The process of juggling weak and strong vocabularies to keep them apart may be a widespread practice, not only in technology but also in the social technology of the sociology of technology. We are no different from those we claim to study!

The De-Description of Technical Objects

Madeleine Akrich

Describing the Interaction between Technics and Humans

Although science and technology are often thought to go together, they are concerned with very different subject matters. Science is taken to go beyond the social world to a reality unfettered by human contingency. Perhaps as a result, the sociology of science has studied the ways in which the local and the heterogeneous are combined to create knowledge with the status of universal and timeless truth. By contrast, sociologists have found it difficult to come to terms with technical objects. Machines and devices are obviously composite, heterogeneous, and physically localized. Although they point to an end, a use for which they have been conceived, they also form part of a long chain of people, products, tools, machines, money, and so forth. Even study of the technical content of devices does not produce a focused picture because there is always a hazy context or background with fuzzy boundaries. Thus even the most mundane objects appear to be the product of a set of diverse forces. The strength of the materials used to build cars is a function of predictions about the stresses they will have to bear. These are in turn linked to the speed of the car, which is itself the product of a complex compromise between engine performance, legislation, law enforcement, and the values ascribed to different kinds of behavior. As a consequence, insurance experts, police, and passers-by can use the condition of the bodywork of a car to judge the extent to which it has been used in ways that conform to the norms it represents.

Technical objects thus simultaneously embody and measure a set of relations between heterogeneous elements. However, the process of describing everything about a car in such terms would be a mammoth task.¹ Furthermore, the end product might well be banal. The automobile is so much a part of the world in which we live that its sociography (a description of all the links making it up) would no