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Strategies, Resources, and the Shaping of Technology

Technologies have social implications. Indeed we have argued that it is impossible to pry technical and social relations apart. The shaping of a technology is also the shaping of a society, a set of social and economic relations. This means that many—perhaps all—technologies are born in conflict or controversy. Different social groups have different concerns, or simply different practices, and hope for or expect different things from their technologies. How are conflicts resolved? How are new technical and social relations set in place? How is irreversibility achieved? The papers in the first section offer certain suggestions. In particular, they point to the importance of the strategies deployed by heterogeneous engineers—for instance, the ways in which system builders deploy organizational and legal resources as they attempt to stabilize a network of social and technical components. The papers in this section build on this theme.

Misa takes us to the history of steelmaking to describe the way in which two controversies were resolved. The first concerned pneumatic steelmaking and a conflict between two groups, each of which held patents crucial to the process. The result was that neither was able to build an advanced Bessemer converter. To have done so would have infringed the patents of the other group. In the geophysical case described by Bowker, Schlumberger defended its patents as a delaying tactic. Although it knew that these would probably turn out to be indefensible, the object was to maintain its strategic position close to the oil exploration companies long enough to build up a body of expertise and a set of practices in which its products were seen as indispensable. Patents thus took the form of a crucial resource. In the case described by Misa they were equally important, but were used quite differently. Instead of fighting in the courts, the two groups agreed to a legal and organizational innovation—the formation of a patent pool from which *both* would profit. The individual legal and technical resources of the two groups were thus combined.

Misa's second controversy concerns the distinction between "iron" and "steel"—one that was important to different protagonists in different ways. Thus, at least in the early stages of the controversy, "steel" carried a price premium. In addition, scientific and professional reputations were at stake: a distinction based on the percentage of carbon demanded the use of (professionally administered) chemical and physical measurements. Finally, there were issues of daily practice. Thus steelmen tended to talk of "steel" to describe metal that fused completely during the process of production, and saw little reason to change their practice. Unlike the patent pool, this controversy was not settled by legal or organizational innovation.