DEFINING technology as a sociohistorical process, Keith Dix examines the technological transformation of the United States bituminous coal industry during the 1920s and '30s. More specifically, he documents the invention, development and widespread adoption of the coal-loading machine, emphasizing its impact "on the social relations of production and on the quality of working life" (page ix).

Building upon his previous study of the coal industry, *Work Relations in the Coal Industry: The Hand-Loading Era, 1880-1930* (West Virginia University, 1977), Dix shows that the early miner was essentially a skilled craftsman. Despite the growing use of undercutting machines during the hand-loading era, miners "largely controlled the production process," through their control of crucial underground skills, through day-to-day worker activism, and increasingly through local and district unions of the United Mine Workers of America. Dix argues that although coal operators developed a variety of strategies for overcoming the miners' control, including company-owned housing and stores, the coal companies largely raised essential capital and marketed the coal, but left numerous day-to-day decisions to the miners.

Under the highly competitive conditions of the 1920s, and especially during the depression of the 1930s, coal operators increasingly mechanized their mines. Dix convincingly demonstrates that their efforts resulted in the growing adoption of the coal-loading machine, ended the hand-loading era, and radically transformed the work process and the social relations of production. Adoption of the mechanical coal loader enabled mine owners to not only reduce their work crews but to concentrate their workers around the machine, to heighten day-to-day supervision of the work force, and to profoundly undermine the miners' freedom. As machines increasingly replaced miners at the center of the work process, "management could more effectively direct the work force in much the same way that workers were disciplined in the modern factory" (x).

Despite the triumph of mechanization in the bituminous coal industry, Dix pointedly argues that it was not a linear process. It was a dynamic historical process, reflecting the complex interplay of capital, labor and the state. Indeed, before the new technology could gain its commanding sway over the industry, coal operators had to undercut the miners' traditional autonomy. Helping to accomplish this feat, he shows in close detail, was the convergence of a multiplicity of forces: i.e., the rise of John L. Lewis (who took a very sympathetic attitude toward mechanization) to the presidency of the United Mine Workers of America; the expanding role of the state under New Deal bituminous coal mining legislation; and especially the growth of a vigorous capital goods industry in coal mining machinery and equipment. The most successful of the coal-loading machines was the Joy coal loader, which inspired numerous coal mining songs, including the
one that gave the book its title: "Tell me, what will a coal miner do? Tell me, what will a coal miner do? When he goes down in the mine, Joy loader he will find" (viii).

While mechanization was frequently heralded by its supporters as a new departure in mine safety and health, in reality Dix documents the opposite. Mechanization not only curtailed the traditional autonomy of coal miners, it inaugurated new occupational hazards. Directly linked to the higher dust levels produced by the new machinery was the rapid spread of pneumoconiosis, the deadly "black lung" disease. Thus, as the machine triumphed, miners continued to resist the onslaught of new technological changes. Through numerous resolutions at annual meetings of the UMWA, many local unions and rank-and-file miners protested against the impact of mechanization on their jobs and the quality of their working lives. Even so, a variety of forces — declining job opportunities during the depression, higher wages mandated under New Deal programs, and the declining significance of small unmechanized mines — helped to mute rank-and-file protest.

What's a Coal Miner to Do? is well grounded in a variety of primary and secondary sources. Dix employs the rich oral recollections of retired coal miners, numerous state and federal government reports, a broad range of industrial, trade, engineering and labor journals and conference proceedings, and the manuscript collections at West Virginia University, especially the papers of the coal operator Justus Collins. The Collins papers permit an unusually detailed case study of life and labor in one coal mining town. Moreover, the book is well illustrated with photographs and sketches of mines, mine machinery, and miners at work, which visually helps to document the impact of changing technology in the coal industry.

While this study adds to our knowledge of the impact of technology on the work process, it also leaves important issues unexplored. Dix makes no effort, for example, to systematically analyze the impact of coal mining technology along ethnic and racial lines. By ignoring ethnic and racial issues, Dix missed an opportunity to strengthen his overall thesis: that mechanization was a social process, perhaps impacting in somewhat different ways on blacks and whites, immigrants and American born. On the other hand, while Dix rightly concentrates on the dominant fields of northern and southern Appalachia, he avoids discussion of the Alabama fields. Given his provocative suggestion that mechanization proceeded more rapidly in nonunion fields, the Alabama experience would seem very instructive because those mines were unionized, marked by a strong tradition of convict laborers, and operated with a predominantly black labor force.

Such critical commentary notwithstanding, What's a Coal Miner to Do? offers fresh insights into the dynamic relationship between technology, the work process, and the quality of working life. By documenting the "rocky path" from the initial invention of the coal-loading machine to its widespread use in the bituminous coal industry, Dix contributes to our knowledge of mechanization as a social as well as technical process. Students of the industrial era, especially in the bituminous coal region, will turn again and again to this important book.

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The Changing Face of Schenley Park

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Remnants of an Industrial Landscape

Pages 128-132 By the authors
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Pages 135-36 By the authors
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Still a Grand View: the Ship Hotel and the Lincoln Highway

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