associated with university-affiliated technology parks offers a reasoned critique of the relatively new trend and calls for community, minority, and female input. By comparing the policies of several university-affiliated parks, she demonstrates that an arena for choice exists; Yale University stands out in particular in its sensitivity to minority concerns in its planning. Wright notes here (p. 354) that business foresees labor shortages in the '90s and hence promotes research on capital-intensive production methods. Her response, that "this diagnosis jars with steadily rising unemployment rates and chronic unemployment in ever larger segments of the American work force" (p. 354) is ill-informed. The statement is imprecise, but by most definitions it is simply not correct. Jobs are still being created in the American economy, but the composition and distribution of them is changing. In fact, further, the predictions about job loss made in several papers in this collection should be put in the perspective of smaller cohorts entering the job market in the next 10 years. Predictions over a longer period are risky, given the interaction of technological change with social and economic factors that the essays show so well. Some occupations may disappear and there will be skill mismatches and groups that lose out in the reorganization of production, but aggregate job loss in the major sectors of women's employment is unlikely in the short run.

This very ambitious volume is provocative and wide-ranging. Its conclusions are by now familiar, emphasizing the embeddedness of technological change in economic and social change and workers' need for meaningful participation in the implementation of technology in the workplace. How that influence is to be achieved and what shape it will take are still open issues.

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Short-Lived Opportunities

Gender at Work. The Dynamics of Job Segregation by Sex during World War II. RUTH MILKMAN. University of Illinois Press, Urbana, IL, 1987. xvi, 213 pp., illus. $32.50; paper, $8.95. The Working Class in American History.

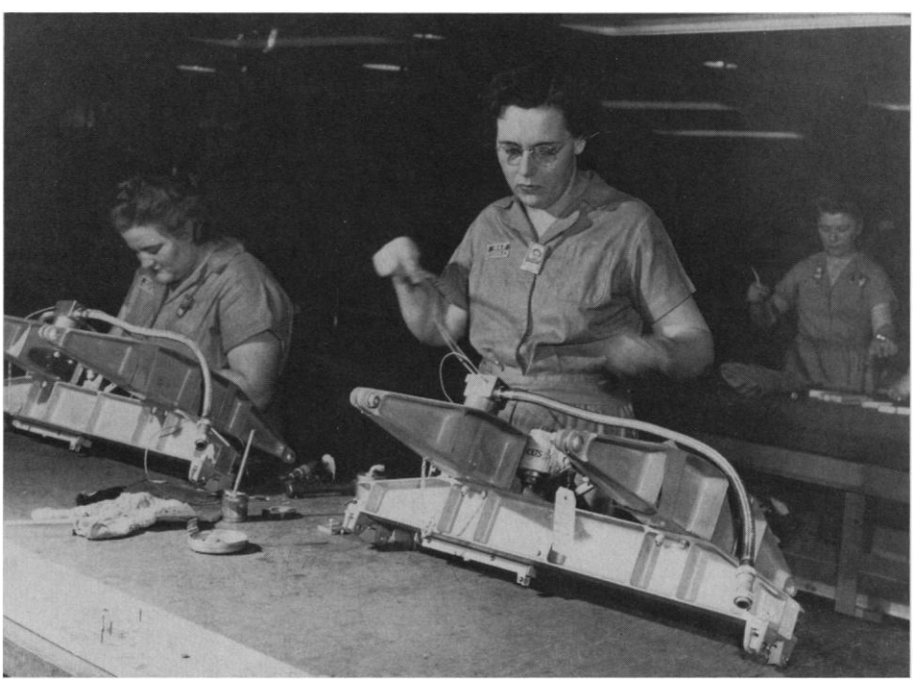
Ruth Milkman's study of women's employment during World War II combines the best of sociology and history. Winner of the Joan Kelly Memorial Prize in women's history for 1987, *Gender at Work* is an important synthesis of women's history, labor history, and the sociology of job segregation. Making masterly use of archival material, Milkman compares the history of women's employment in the auto and electrical industries from their inception through the post-war period. She rejects the "deterministic" sex-segregation theories of labor market segmentation as well as those of the Marxist-feminists and moves beyond them by examining the structures and managerial practices of the two industries.

"Front cover, special supplemental edition to UAW-CIO *Ammunition*, August 1944." [From *Gender at Work*; United Automobile Workers]

At the time of these industries' formation, managerial strategies determined the sexual division of labor in accordance with the specific conditions of the respective labor markets. The industries had many features of mass production in common, and both employed women from the start. However, the labor-intensive electrical industry, where production was based on a piecework system, employed an increasing percentage of female workers, whereas in the auto industry, which concentrated on mechanization, women constituted a much lower percentage of the labor force. Both industries practiced sex segregation prior to the Depression and hired women only to perform specific tasks rather arbitrarily designated as women's work.

The introduction of industrial unions in the 1930s in both these industries did little to alter the ideology of sex segregation. Despite the progressive views of the CIO on discrimination, both the United Auto Workers (UAW) and the United Electrical Workers (UE) took stands that reinforced sex differentials in wages and separate seniority systems. The economic upheaval of the Depression left women's employment unaltered in both industries as unions attempted to protect the status quo.

Though World War II expanded job opportunities for women in both auto and electrical work, it also, according to Milkman, proved both the "resilience" and the "flexibility" of the ideology of occupational segregation. The war proved more disruptive to traditional hiring practices in the auto



"Women working on bomber parts at a De Soto plant, Detroit, 1942." [From *Gender at Work*; Wayne State University Labor Archives]

than in the electrical industry, but in both industries conversion to war production created new work processes that had no traditional gender assignment. Yet after the war, though there were protests and conflict over the role of women in industry, the concerns of both unions and management, among them fear of another depression, precluded an effective direct challenge to the traditional ideology of women's work.

Milkman argues that pre-war experiences shaped the positions taken by the unions after the war as the issue of sexual division of labor became part of wider industry-labor conflicts. In the automobile industry, where there was not a history of attempts to replace men with women, the UAW looked to seniority as the means of protecting its male membership's jobs. The UE, by contrast, fearing displacement of its male members by the cheaper labor of women, saw its interest as lying in pay equity between the sexes.

Historians have analyzed the reversion of women to traditional roles after World War II from several perspectives. Some have focused on the role of an ideology of domesticity in convincing women to return to the home, and others have emphasized the role of unions, which used seniority as a way to force women out of their wartime jobs. Milkman believes these arguments provide only a partial explanation. She persuasively argues that, owing to the "weight of tradition" and its perception of labor's ambivalence, management through its control of the hiring process played a central part in restoring the pre-war status of women. Though women union members often fought to maintain the gains that had been made during the war, they were caught between their class interests as union members and their gender interests as women. Unlike blacks, who had the NAACP to support them, women in the 1940s had no outside movement to back their cause. Though the post-war conflicts in the electrical and auto industries differed, the outcome was the same; women could not capitalize on their wartime gains. The traditional roles of women in these industries had been established at the beginning, and management reinforced them after the war.

Milkman's subtle analysis of the industrial structure is a major step forward in understanding the roots of the persistent problem of occupational sex segregation. *Gender at Work* is valuable not only as a historical monograph but as a contribution to theory.

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Career of a Physicist

Alvarez. Adventures of a Physicist. LUIS W. ALVAREZ. Basic Books, New York, 1987. xii, 292 pp. + plates. $19.95.

Discovering Alvarez. Selected Works of Luis W. Alvarez, with Commentary by His Students and Colleagues. W. PETER TROWER, Ed. University of Chicago Press, Chicago, 1987. x, 272 pp., illus., + plates. $37.50.

Luis W. Alvarez is one of the most remarkable physicists of the 20th century. During his long career he has made impressive contributions in a surprising variety of fields: nuclear physics; radar development; the atomic bomb; accelerator design; elementary particle research; cosmic ray investigations, including a search for hidden chambers in the pyramid of Chephren using cosmic ray muons to form an "x-ray" image; earth history with the formulation and study of a hypothesis that mass extinctions at the end of the Cretaceous period were caused by impact with Earth of an asteroid or other large extraterrestrial object. The highlights of this career and the stories behind the accomplishments that have marked it are the subject of these two books.

While he was a student at the University of Chicago in the early 1930s Alvarez worked in optics and cosmic ray physics, the latter under Arthur Holley Compton. He then went to Berkeley and began his long association with Ernest O. Lawrence and the Radiation Laboratory. During the first four-and-a-half years there he carried out several outstanding experiments in nuclear physics. These included pioneering work on K-electron capture by nuclei, a remarkable measurement, made with Felix Bloch, of the magnetic moment of the neutron using the magnetic resonance technique with a neutron beam, and a study of helium and hydrogen isotopes of mass 3 showing that, contrary to then-current assumptions, ^{3}He is stable and ^{3}H radioactive.

Then, in late 1940, he departed for the Massachusetts Institute of Technology to join the new radar project, and he contributed much to its spectacular success. During this period he invented and developed with Larry Johnston the ground-controlled approach (GCA) system for landing aircraft in bad weather. Later he joined the atomic bomb project at Chicago and Los Alamos, where he made a crucial contribution regarding simultaneous detonation of many explosive lenses for the implosion bomb. At the end of the war Alvarez and a few colleagues flew on the Hiroshima mission in order to make measurements of the blast wave using equipment they had developed. The experiences during war work in both the radar and the atomic bomb projects were exciting indeed, and the descriptions of this period, by Alvarez in the autobiography and by Johnston in *Discovering Alvarez*, are highlights of both books.

After the war Alvarez returned to Berkeley and to his work in physics, invention, accelerator design and building, and the other diverse enterprises mentioned at the beginning of this review. The work for which he has received the most acclaim, including the 1968 Nobel Prize in physics, was the development and construction of the large hydrogen bubble chamber, together with the complex measuring equipment necessary to utilize it effectively, and his leading role in the large experimental effort devoted to exploiting this powerful technique. This program was extraordinarily productive; during a period of several years in the late '50s and early '60s it produced many of the most important results in elementary particle physics.

In a chapter of his autobiography entitled "Scientific detective work" Alvarez describes two examples of how he applied his powers of observation and analysis to reach unexpected conclusions. One was finding a very ingenious "conventional" explanation for a cosmic ray event found by a Berkeley colleague who had interpreted it as a magnetic monopole. If true this would have been a fantastic discovery, but after Alvarez's analysis no one believed it was true. The other example was an analysis of evidence concerning the Kennedy assassination, primarily that contained on an eight-millimeter film taken by Abraham Zapruder. Although the film had been examined by experts for the Warren Commission, Alvarez was able to reach new and important conclusions from it. Although these incidents represent relatively minor accomplishments in Alvarez's career, they illustrate an approach to problems and methods of attack that are characteristic of much of his work. Many scientific problems require the same sort of scientific detective work for their solution. We could hardly find a better example than the puzzle presented by the geological sample from the Cretaceous-Tertiary boundary near Gubbio, Italy. This sample, shown to Alvarez by his son Walter, led eventually to the impact hypothesis for explaining the extinctions at the end of the Cretaceous. The fascinating