

Vol. 16 No. 11 (November, 2006) pp.878-882

CHALLENGING THE CHIP: LABOR RIGHTS AND ENVIRONMENTAL JUSTICE IN THE GLOBAL ELECTRONICS INDUSTRY, by **Ted Smith, David A. Sonnenfeld, and David Naguib Pellow (eds)**. Philadelphia: Temple University Press, 2006. 368pp. Hardcover. \$77.50. ISBN: 1592133290. Paper. \$25.95. ISBN: 1592133304.

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At first glance, this is an oft-told tale well told once more. The twenty-five essays set forth in **CHALLENGING THE CHIP** chronicle and analyze how the rise of the consumer electronics industry has been accomplished by means of the brutal exploitation of the people who work in its factories and live in communities where its environmental effects are later felt. In short, the owners and senior managers who control and profit from the consumer electronics industry—as well as the consumers who benefit from low prices—are able to do so because other people are exploited and sickened while the environment is despoiled. Aside from the particulars (and there are literal devils lurking in the details), this is much the same story as that told by Friedrich Engels in his **THE CONDITION OF THE WORKING CLASS IN ENGLAND IN 1844**: industrial manufacturing firms are exploiting workers and crippling the public health much as they did in Engels's Manchester over 150 years ago. The key ironic difference is that, while the exploitation and crippling were plain to the eye long ago, in today's global electronics industry, with its much vaunted "clean rooms" for manufacturing and lack of obvious smokestacks, the undeserved reputation as a "clean industry" must be debunked by careful examination of often incomplete health data from all over the world.

Of course, even if the essentials remain much the same, the specifics are substantially different in today's high-tech, globalizing economy. The book identifies three core concerns with the industry. First, electronic products are manufactured using more than a thousand toxic chemicals known to cause cancer, miscarriages, asthma and/or other health problems. Second, the industry's profit strategy of "planned obsolescence" has caused an explosion in the number of electronics products that are replaced and discarded each year at a rate faster than they can be responsibly recycled. Third, actual product manufacturing has been shifted to low-wage countries with weak labor and environmental laws, which yields bad occupational and public health and continued poverty.

To address these concerns, the editors have divided the book into three parts: "Global Electronics," which explores the history and political economy of the industry; "Environmental Justice and Labor Rights," which shows how workers have organized to demand that the industry improve its record of endangering health and exploiting labor; and "Electronic Waste and Extended [*879] Producer Responsibility," which sheds light on the literally toxic consequences for the planet of present-day electronics disposal practices. Taken together, the book's three parts present a cradle-to-grave (i.e., manufacture to disposal) approach to the industry and its

problems. Further, the authors, a mixture of academics and activists, are not content merely to describe problems; they also advocate solutions to the challenges posed by this industry. The solutions are of a decidedly progressive, rather than radical, nature, as they involve enhanced national and international regulation, organization of workers into effective, independent unions, and corporate campaigns to persuade or compel manufacturers to adopt policies more in harmony with worker health and environmental protection.

Part One, "Global Electronics," sets forth seven essays that limn the contours of this industry. Particularly notable is Boy Lüthje's piece, pointing to two key divergences in the industry that mask its hidden costs and make their amelioration much more difficult. First, Lüthje demonstrates a separation between manufacturing on the one hand and branding and design on the other. While subcontractors operating mainly in low-wage countries perform the actual manufacturing, well-known firms located in "advanced" countries accomplish product design and branding. This creates the impression in the latter countries, where the balance of electronics consumers reside, that the industry is a clean, post-industrial one by hiding the heavy manufacturing thousands of miles away. Second, even as the brand-name sector of the industry experiences market concentration, the manufacturing sector endures increasing fragmentation and competition, resulting in a "race to the bottom" as manufacturers attempt to increase market share by holding down wages, increasing hours, and enforcing dangerously unhealthy working conditions. As Boy notes, this economic logic makes it more difficult to hold brand-name companies responsible for the actions of their subcontractors, even though those actions constitute a necessary response to pressures emanating from the branding companies: a situation quite familiar to those who have campaigned against sweatshops in the global apparel industry.

Also worthy of praise are Joseph LaDou's essay, "Occupational Health in the Semiconductor Industry," which points out that the industry, despite its use of known toxic chemicals in manufacturing, took no steps to study their effect on workers' health, and even blocked such investigations when they were attempted; Apo Leong's and Sanjiv Pandit's article, "'Made in China': Electronics Workers in the World's Fastest Growing Economy," which exposes the abusive working conditions, low wages, long hours, and non-enforcement of China's labor laws; and Andrew Watterson's piece, "Out of the Shadows and into the Gloom? Worker and Community Health in and around Central and Eastern Europe's Semiconductor Plants," which shows how the introduction of the semiconductor industry into post-Communist Eastern Europe has replicated much of the former regime's [*880] abysmal environmental and public health record.

Part Two, "Environmental Justice and Labor Rights," shifts the focus from the global political economy to local struggles by electronics industry workers against the dangerously toxic conditions under which they work. There are three essays on Silicon Valley, California, two each on Mexico and Taiwan, and one on Scotland's "Silicon Glen." Though the stories of corporate indifference to occupational illness and hostility to government and union attempts to address it are depressingly similar, an emerging pattern of international cooperation amongst affected workers gives cause for optimism. Indeed, the book under review is the result of such coordination, arising out of a 2002 symposium sponsored by the Silicon Valley Toxics Coalition (SVTC) and the International Campaign for Responsible Technology (ICRT), which brought together activists and academics from fifteen countries to discuss problems and propose solutions. All of the essays in this section are meritorious and well worth reading, as they demonstrate that the self-activity of the workers themselves is the necessary foundation for change, because of their inside knowledge of the industry and potential leverage over employers.

Particularly suggestive is labor leader Robert Steiert's section-concluding essay, "Unionizing Electronics: The Need for New Strategies," which advocates two sets of measures to increase unionization in the industry. First, to address the transnational nature of the industry and the solutions to its abuses, Steiert argues for increased emphasis on International Framework Agreements (IFAs) between Global Union Federations, such as Steiert's own International Metalworkers' Federation, and international electronics firms. Such

agreements, which thus far are an almost exclusively European phenomenon, bind the corporate signatories (and their subcontractors) to a specific code of conduct regarding labor issues, including the rights to organize and bargain collectively, bans on child and forced labor, and workplace equality. While such agreements do not directly organize workers, Steiert contends that they “can create an environment in which workers may unionize without fear of reprisal” (p.195). Although only one US company has signed an IFA, Steiert believes that if American unions recognized the benefits of IFAs, they might win important gains, particularly a ban on “union-busting.” Second, Steiert argues that new organizing strategies, including more transnational organizing, formation of alliances with human rights and environmental advocacy groups, and changes to union structures, will be necessary to achieve organizing success. He does not, however, propose specific cutting edge strategies, such as corporate campaigns or consumer boycotts.

Part Three, “Electronic Waste and Extended Producer Responsibility,” explores the concept of “extended producer responsibility” (EPR), under which electronics manufacturers would be responsible for the environmentally sound disposal of the toxic elements found in their high-tech components. As things stand now, such “e-waste” is either dumped into landfills where it [*881] contaminates the soil and groundwater, or it is shipped to poor countries, where underpaid workers perform the dangerous work of salvaging the rare but highly toxic elements from the battered remains of yesterday’s high-tech novelties. In both scenarios, public and worker health suffer. Not only does EPR for waste make sense from an environmental perspective, authors Leslie Byster and Ted Smith, in “The Electronics Production Life Cycle. From Toxics to Sustainability: Getting Off the Toxic Treadmill,” argue that, given the tremendous energy, natural resources, and toxic wastes involved, economic as well as environmental sustainability is at issue.

These points are further amplified in Jim Puckett’s essay, “High-Tech’s Dirty Little Secret: The Economics and Ethics of the Electronic Waste Trade,” demonstrating that the exportation of e-waste to poor Asian countries, where it is salvaged under conditions extremely dangerous to worker and public health, is perfectly “rational” according to the principles of neo-classical economics. Puckett’s not entirely novel solution is to employ a system of “ecological economics” pursuant to which the value of public health, biological diversity, and other social values would be no longer externalized from the calculus of political economy, and would undermine the “rationality” of the global dumping of e-waste. Although not new but certainly worthy, there are substantial difficulties in determining how to measure these social values and then make them part of a rational economic actor’s decision making process.

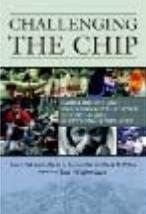
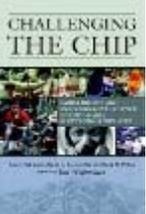
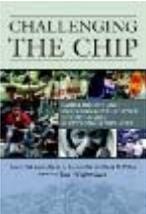
Nevertheless, such issues are by no means insurmountable, as two essays, Naoko Tojo’s, “Design Change in Electrical and Electronic Equipment: Impacts of Extended Producer Responsibility Legislation in Sweden and Japan,” and David Wood’s and Robin Schneider’s, “ToxicDude.com: The Dell Campaign,” show how EPR can be implemented in the real world. The upshot of this section seems to be that a combination of worker, consumer, and political pressure can lead electronics firms to accept their responsibility for appropriate disposal of their products, as the last two referenced articles demonstrate in very different political and social contexts.

While the limited success stories relating to EPR are cause for optimism, the lack of substantial progress on the occupational health front is equally cause for concern. The thrust of this book seems to be that, because the high-tech industry has shown such prodigious technological ability in the past, it can surely use its expertise to solve the labor and environmental problems it has created. As editor Ted Smith said in a recent press release, the book “is about challenging the industry to use its incredible ingenuity to dazzle the world all over again with cleaner, greener technologies, products, and components that are free of toxics, easy to recycle, and produced without harm to those manufacturing, assembling, and disassembling them.” The question remains open whether a combination of worker, consumer, and political pressure can persuade or compel this global industry to change its business practices in ways that, despite their social utility, [*882] will likely cut into corporate profit margins. Although the consumer electronics industry is somewhat different from the global apparel industry, the continued exploitation of workers in the latter industry despite

international sweatshop reform campaigns, certainly indicates that the struggle will not be an easy battle.

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