

course in fluid mechanics, I am sure the text will be adopted by many faculty members who will find very useful problems they can assign at the end of each chapter.

The book has 18 well-written (and very well mathematically documented) chapters as follows:

- The role of fluid mechanics in safety and environmental protection
- Properties and phenomena characterizing nonhomogeneous flows
- Steady and quasi-steady outflow due to gravity
- Unsteady outflow driven by gravity
- Outflow from pressurized containers and pipelines
- Liquid spills on the ground – spreading and evaporation
- Liquid spills on water – the problem of oil pollution
- Unsteady diffusion from a finite volume
- Passive dispersion from steady sources in a turbulent environment
- Steady and unsteady buoyant releases in the atmosphere
- Jets and plumes in crossflow
- Gravity-driven flows with large changes in buoyancy
- Heavy-gas dispersion in the laboratory and in the atmosphere
- The effects of plume-surface interactions
- Fire, combustion processes and combustion waves
- Explosions and pressure waves
- Theoretical solutions for strong explosions
- Damage criteria and damage assessment.

GARY F. BENNETT

Case Reopened: Reassessing Refillable Bottles, D. Saphire, Inform, New York, NY, 1994, \$25.00, 366 pp., ISBN: 0-918780-62-4

The advertising brochure for this book presents a startling statistic:

“US residents emptied 120 billion beer and soft drink containers in 1990: 95% of them went into the waste stream—more than 5% of the total waste handled in the United States that year.” [But Table 1-1 p. 2, shows only 4.0% and Table 1-3 p. 4 shows 5.5% in 1990.]

Inform’s corporate goal is waste reduction. Hence, promotion of refillable bottle reuse promotes that goal. But “is refilling better than recycling” the author asks rhetorically in the preface.

Today only 5–7% of the containers for beer and soft drinks are refillable. In this report, Inform concludes that refilling can be beneficial, moving the country towards a more sustainable society. Inform calculates that under a scenario in which the 1990 market share of aluminum cans remained constant and all glass and polyethylene terephthalate (PET) bottles were refilled and reused 25–35 times, the weight of beer and soft drink container waste would be reduced by 73.0% from 1990 levels. [A personal comment: Why does an author give three-figure accuracy to his/her results, i.e., 73.0%, when the calculations are based on only one figure accuracy, i.e., 7% or a range, i.e., 25 to 35%?]

The second chapter, Findings and Conclusions, is clearly the most important chapter in the text. Indeed, I might have put this chapter first in the book. In this chapter, the author discusses the findings of his report, noting (among other things):

- beverage containers comprise 5.5% (1990) of the weight of the US municipal solid waste stream
- source reduction by using less material to make a container, selling concentrated beverages, or reusing containers by refilling are good pollution prevention strategies
- one-way containers dominate the U.S. market
- with a sufficient number of fillings, the refillable bottle can reduce the environmental impact associated with materials extraction and container manufacturing
- recycling containers saves energy
- energy used in washing refillable bottles is more than offset by savings in energy that would be required to make additional new bottles
- a review of the literature shows that one-way bottles use more energy overall than refillable bottles
- for the delivery of a beverage, the amount of water needed to wash refillable bottles is small in comparison with the water used in manufacturing new one-way bottles.

The foregoing are some of the many conclusions reached by the author, but he has studied the problem and its complexities well, and I believe fairly assessed the diverse impacts of the problem. Indeed, he has tried to balance the equities of recycling versus disposal.

Case histories of two firms' successful recycling programs are given.

A one hundred-item bibliography is found at the end of the report.

GARY F. BENNETT

Recycling and Reuse of Industrial Wastes, L. Smith, J. Means and E. Barth, Battelle Press, Columbus, OH, 1995, \$34.95, 116 pp. (8½ by 11 in. format) ISBN: 0-935470-89-1

Both morally and legally, industry (world-wide) is being encouraged and sometimes forced to reduce its production of hazardous waste. To that end, the authors of this book define their purpose in writing it:

“The intent of this handbook is to assist pollution prevention efforts by encouraging recycling and reuse of wastes found on Superfund or Resource Conservation and Recovery Act (RCRA) Corrective Action sites. This handbook outlines specific technologies for recycling and reuse of materials that require remediation at contaminated sites. Case studies within the handbook document applications of these technologies to real-world conditions.”

This book is unique among waste minimization treatment books since it focusses on cleanup-derived wastes rather than newly generated industrial hazardous wastes.

This handbook discusses recycling and reuse options from a wide variety of wastes: organic and inorganic; liquid and solid, i.e., petroleum-contaminated sludges,