TABLE 1
Term Projects: Spring 1992

- Parallel branch and bound for mixed integer linear programs
- Numerical implementation of conjugate gradient and Gaussian elimination methods on parallel computers
- Parallel computational solutions of hyperbolic PDEs (humidification waves in solar energy desiccants)
- Polyhedra in Stokes flow (particle simulations on the iPSC/860 and CM5)
- Molecular dynamics on the hypercube (simulation of Lennard-Jones fluids)
- Wavelet transforms for signal analysis (signal data compression)

Oral presentations, conducted during the last two weeks of the course, present students with the opportunity to learn from each other. A number of established techniques in the literature, as well as new tricks on a particular machine, are disseminated in these discussions. Course grades are computed on the basis of the oral presentation and written report.

At the end of the semester, the student evaluations were collected. On the basis of a very favorable response, it appears that this course will be a regular spring semester offering in the department (and in the college of engineering). Work is also underway to integrate this course into a multicourse sequence in parallel computing in the Computer Sciences Department. A two-day version of the course is also available from the AIChE Continuing Education Division.[10]

One final note: computer programs developed for the term projects are archived on a file server for future reference. It is my intention to document the growth of the parallel computing culture by monitoring the evolution of student projects, in terms of style and level of sophistication, starting with what future generations may view as the dawn of the age of parallel computing.

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ChE **book review**

CHEMICAL ENGINEERING DESIGN PROJECT: A CASE STUDY APPROACH

by Martyn S. Ray and David W. Johnson
Gordon and Breach Science Publishers, New York; 357 pages, $90 hardbound, $65 softbound (1989)

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This text is intended for use in the senior design course for chemical engineering students. It offers an approach that is different from that of the usual design course text; whereas the others provide a general overview of the design process, this text deals in considerable depth with just one project—the development and design of a plant to produce nitric acid from ammonia and air. The factors supporting this project are dealt with in considerably more detail than would be the case for the usual text.

The book is divided into two main parts plus a lengthy appendix. Part I covers general aspects of a proposed nitric acid plant: feasibility study, process selection, site location, preliminary process design, and economic evaluation. Part II covers detailed design aspects, with sub-case studies of the absorption column, the steam superheater, and a pump to remove liquid from the absorber. Appendix contents include supporting property and cost data and example equipment calculations. Notable, the book contains no information on capital or manufacturing cost estimating or profitability analysis. No mention is made of discounted cash flow, for example. How-

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streams) is an outstanding example of applying new concepts to old problems. Whether or not they attract one's fancy, their importance will continue undiminished. So the educator, the researcher, and the funding agencies must look at new concepts in traditional areas with almost the same enthusiasm as at the emerging areas. Nucleation and growth must remain simultaneous.

The chemical industry, notwithstanding the strains and vicissitudes imposed by a fluctuating economy and an increasing appreciation of environmental concerns, permeates practically every facet of our lives and depends for its continued development on invention as well as innovation. Invention is getting a novel idea which works; innovation is overcoming all hurdles to its economic use.[26] There is scope for both in CRE. To ensure continued dominance, academic research must become increasingly bold, industrial research must be supported rather than managed, and both must be more accommodative of shifts in approach and the delays they entail.

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ever, the authors do provide some insight into hazardous operations analysis and general safety considerations.

The nitric acid process selected is the traditional one without the more modern modification of reaction gas compression. Surprisingly little is said about the need for cleanup of the tail gases from the absorber. The authors have provided a relatively simple process with a great deal of supporting data. This should have appeal to faculty members who understand quite well that it is an onerous chore to dig up all the supporting information for a realistic case study.

The use of this text in the design course should follow an introductory design course which treats such matters as equipment cost estimating, profitability studies, profit and loss statements, and the like. The authors point this out in the introductory material. If only one semester is allocated to design, it is the opinion of this reviewer that adoption of this book would be a mistake. On the other hand, if a second semester (or quarter) is available, material in the book can support one or more worthwhile case study projects. ❐