nuclear weapons at Los Alamos during World War II. He has been an active member of Brookhaven National Laboratory's Technical Support Organization on Safeguards since its inception in 1968.

Air Pollution: Threat and Response

D. A. Lynn
388 pp. Addison-Wesley, Reading, Mass., 1976. $8.95

Prior to the green revolution of the 1960's, most books on air pollution were stodgy tomes directed at the practicing engineer and containing mostly how-to information. The average person considered air pollution to be something that happened on the other side of the tracks, and flight to the suburbs provided an effective solution to most air-pollution problems.

With awakened public interest in the environment, air-pollution problems have come to be of much greater general public interest. There is a feeling, justified or not, that even with strong antipollution legislation air quality is deteriorating. But it is hard for the average person to find technical information—accurately presented in lay terms—on which to make rational judgments. Most often the only way people learn about a complex topic of current interest is through the newspapers. There are very few places where the average citizen can get information of a technical nature presented in an understandable form that is not condescending.

The book *Air Pollution: Threat and Response* by David A. Lynn provides an excellent source of general information on air pollution and air-pollution control. This volume should be of value for someone interested in learning about the many problems associated with controlling air pollution, but who is not interested in wading through vast quantities of technical details. The book should also be of value to the professional who wants a broad, general overview of the air-pollution problem, with more emphasis on the sociological and legal aspects of the problem than is found in the more traditional engineering texts. Lynn is a scientist involved with air-quality data research for the GCA Corp.

The book, which was written as a text to introduce people to the many-faceted issues of air pollution and its control, consists of twelve chapters and an epilogue. Chapter topics range from a general introduction to the air-pollution problem through discussions of meteorology, types of pollutants, health, economic and ecologic effects, measuring and monitoring of air pollution, sources and source control, pollution law and finally control strategies. As one would expect from a good textbook, each chapter starts with a short section explaining the purpose of the chapter, and there seems to have been a

conscious effort on the part of the author to have each chapter flow into the next. Facts and numbers are given throughout the book without citations, but each illustration and most tables are referenced so that the picky reader can, if he desires, check up on the author. In addition, there is a "further reading" section at the end of each chapter. Here, rather than merely listing references, Lynn discusses additional reference sources, pointing the way for further study. An extensive bibliography and good index also make this book valuable.

It's a pity that a little commercialism was allowed to slip into one section of the book. In a quite readable discussion of currently accepted pollution-measurement techniques, an automatic particulate-monitoring device still to be proved and only recently marketed by GCA was discussed along with other more common automatic devices. A review of this instrument's characteristics appears to be definitely out of place in Lynn's otherwise-excellent presentation.

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The Nucleon–Nucleon Interaction

G. E. Brown, A. D. Jackson
242 pp. North-Holland, Amsterdam, 1976. $19.95

The nucleon–nucleon force has provided many quantitative tests of the dynamical consequences of relativistic quantum mechanics. Predictions of field theory and of dispersion theory have been verified. Moreover, the formulation of a potential representation enables the theory to be applied to nuclear many-body systems.

Yet only a small number of afficionados have been aware of the accomplishment. *The Nucleon–Nucleon Interaction* by Gerald Brown and Andrew Jackson should go a long way to rectify this situation. The book emphasizes the theoretical view throughout, but it also supplies the needed phenomenological context. Details are provided of the dispersion-theoretical approach and results, of one-boson-exchange calculations and of part of the field-theoretical approach. As one expects from these authors, who have done much important work in the field, the discussion emphasizes physical insight at every opportunity.

It is my impression that the book is directed at the intermediate graduate student beginning research in strong interactions. While recognizing the validity of that goal, I regret the probable decrease of impact on sophisticated particle theorists. Few of them have paid enough attention to the field, and it is they who would bring such a book to the attention of students. I expect theorists may be discouraged by lengthy discussions that could be replaced by more succinct statements leading to stronger results, were more knowledge assumed.

Effective-range theory is derived and applied to the deuteron and to proton–proton scattering. The authors use separable potentials to exemplify scattering theory. This last I find unsatisfactory, as the results are not generalizable without an infinite expansion in separable potentials, while the first terms represent the data and theory poorly. The discussion of the N/D equations, which follows, is of more general use.

An important section, which validates the whole approach of the book, treats the representation of the relativistic Bethe–Salpeter equation by a potential to be used in the Lippmann–Schwinger equation. As a prelude to introducing specific particle exchanges the authors discuss asymptotic form factors. They ignore other vertex connections, which can be important at the ranges being considered.

The going gets heavy with the dispersion-theoretical calculation of the two-pion-exchange contribution. Even numerical aspects are treated. The completeness has its merits, but it is cumbersome and occasionally lacks lucidity.

The final chapters on the construction of the potential and the conclusions are well written and illuminating. There are useful comparisons of the results of the Stony Brook group (see A. D. Jackson, D. O. Riska, B. VerWest, *Nuc. Phys.* **A249**, 397, 1975) with those of the Paris group

(see M. Lacombe, B. Loiseau, J. M. Richard, R. Vinh Mau, P. Pires, R. de-Tourreil, *Phys. Rev.* **D12,** 1495, 1975) and with phenomenological potentials. Risking the charge of self-advertisement, I will express my disappointment at the omission of comparisons with new and old (see, for example, F. Partovi, E. L. Lomon, *Phys. Rev.* **D5,** 1192, 1972, and E. L. Lomon, H. Feshbach, *Ann. Phys.* [NY] **48,** 94, 1968, respectively) field-theoretical treatments of one-boson and two-pion exchanges.

Unfortunately the book has been produced with many typographical errors, some of them very consequential. I mention two such here to alert the reader. Figure 48a has the Reid soft-core and the dispersion-theoretical potentials mixed up, and Table 1 (page 422) should be headed "... from energy-*in*dependent analysis."

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A Taste of Science

R. J. Tykodi, ed.
134 pp. Technomic, Westport, Conn., 1975. $10.00

The subtitle of this odd collection of essays and excerpts brings out the author's intended purpose: "An anthology of writings by scientists, writings of good literary quality showing—among other things—the human side of science." A quote from one of the essays included, the introduction to Lewis and Randall's 1923 edition of *Thermodynamics and the Free Energy of Chemical Substances,* illustrates the editor's taste in good literary quality: "Science has its cathedrals, built by the efforts of a few architects and of many workers. In these loftier monuments of scientific thought a tradition has arisen whereby the friendly usages of colloquial speech give way to a certain severity and formality. While this may sometimes promote precise thinking, it more often results in the intimidation of the neophyte."

The author, I believe, has inadvertently given aid and comfort to some of the criticism he hopes to counter. The inhumanity of science, some have alleged, is manifested through the scientist's reliance on technical terms, precise usage and rule-governed reasoning. The selected essays attempt to undercut this allegation by showing that scientists can also be chatty and informal, can reminisce and ramble, can even give recipes for scientific success (Guess. Work out the implications of the guess. Test them and reject failures. Thus George Polya and Richard Feynman). The essays, unfortunately, rarely clarify the nature of science or the methods of disciplined thought regarded as basic to science.

The selections included can be roughly grouped into three types. First there are accounts of the lives of scientists—autobiographical reminiscences by Nobel laureates and two essays concerned with Paul Ehrenfest's suicide. The account I found most informative was Peter Medewar's diagnosis of Charles Darwin's illness as Chagas disease (transmitted by a bug known to have bitten Darwin in Argentina) rather than neurosis. The second group consists of essays from different fields, stressing the non-technical aspects of science as the hard core of scientific explanation. The third group represents informal, or humorous, illustrations of scientific explanation. Some, like D'Arcy Thomson's "On Magnitude" and Erwin Schrödinger's "What is Life?" have the familiarity of established classics.

Many educators are concerned with the rising tide of antiscientific sentiment and the concomitant tendency to picture scientists as something more or less than human, as starry-eyed idealists or calculating people-manipulaters. The present anthology nibbles a bit at the frothy Frankenstein by showing that scientists do indeed have human emotions, aspirations and even failings. Yet I wonder whether a teacher attempting to interest the non-scientist in science should com-