BOOKS

Flowing Gas-Solids Suspensions, R. G. Boothroyd, Harper & Row, New York (1972). 289 pages. $14.00.

Like others in the publisher's Powder Technology Series, this book examines one specific aspect of the subject, namely, the flow behavior of relatively dense suspensions of particles in a gas. Aerosols, or low mass-concentration gas-particle systems, are not treated; neither are fluidized beds or bin and hopper discharges per se, because flow is not oriented in any particular direction in the first instance and the stream is usually too dense to be considered a suspension in the second. The concern of the book is primarily with basic dynamic phenomena. It is written for the practicing engineer who has limited time for study and is without first-class library facilities who, nevertheless, encounters a design problem or who finds himself in a trouble-shooting situation.

Early chapters review the fundamentals of particle dynamics and turbulent flow. A chapter treats mass flowmeters, particle sampling, gas and particle velocity measurements, dispersed density, electrostatic charging effects, and related subjects. One chapter is devoted to the examination of suspension flow by dimensional analysis. Momentum and heat transfer and turbulence generation are each chapter subjects. The particular problems arising from particle electrification and the explosion hazards associated with electrification are treated separately as is compressible flow and suspension thermodynamics. Boundary layer flow, including turbulent deposition and surface erosion, is covered in one chapter. Finally, one rather brief chapter offers some practical guides relative to pneumatic conveying and centrifugal blowers and offers two examples of computer-aided design, one for a louvre-type separator and one for a spray drier.

The material in the book is amply referenced, hence the author has emphasized physical explanation and relied on the technical literature for detailed presentation of mathematical technique. Many of the circumstances considered are extremely complex, and idealized situations have to be resorted to for examination. Such results are valuable, nevertheless, for they indicate the relative importance of parameters. All chapters are introduced with a helpful brief statement setting forth the topic to be covered, special conditions or positions assumed, and limitations imposed. A general table of nomenclature is provided and each chapter has a separate listing for terms especially applicable to it.

Because of the restricted subject matter, not every chemical engineer will find Boothroyd's book of interest. But it will be of value to any engineer or scientist who is involved in powder handling or processing.

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Water Pollution by Oil, Peter Hepple, Ed., The Institute of Petroleum, London (1972). 393 pages. £ 5.50.

This publication is a compilation of papers, largely by British authors, presented at a seminar held at Aviemore, Scotland, May 4 to 8, 1970. Many aspects of water pollution by oil are discussed—from the anticipated growth of the oil industry to transportation (vehicular and pipeline), bulk storage, and refinery operations, to spill containment and countermeasures. Some spills experienced in British waters are described.

One author, P. C. Blokker, defines a most intelligent approach to the effective control of effluent discharges—the reduction in volume of process water.

Several of the papers are too brief to provide comprehensive and useful information. For example, A. C. McGechan fleetingly discusses check valves. The importance of such valves between a bulk storage tank and the master control valve on a tank's bottom entering fill line can make the difference between a major and minor spill in the event of pipeline or flexible transfer hose failure. The same author discusses tank truck loading and service stations. No mention is made of the numerous spills experienced when tank trucks pull away from loading racks without first disconnecting cargo and grounding lines. In a description of service station operations, some pollution aspects are not covered. The economics of re-refining sump oil has eliminated the business with the result that nightly dumpings of waste oil into storm sewers creates major spill conditions in most metropolitan areas.

The book describes spill containment techniques and frankly admits that containment booms are not yet available for open ocean use.

The oil industry's panacea for controlling contaminated discharges from tankers through the Load-on-Top technique is detailed, but the fact that the system is weather restricted and relies on the unpredictable human element are not discussed.

The effects of oil and oil dispersant chemicals on the flora and fauna is very well covered by both U.S. and British authors.

An extensive bibliography is provided in the reference listings to many papers; however, in most references the subject material is not given for ease of use.

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Industrial Filtration of Liquids, Derek Purchas, Chemical Rubber Company, Columbus, Ohio (1972). 492 pages. $33.30.

The reviewer knows from personal experience that the author is a competent practitioner in the general field of filtration. Purchas has used his experience to prepare an excellent review text that anyone working in the broad field of industrial filtration will find a useful working addition to his library. He covers a wide range of equipment, encompassing gravity clarification and thickening, hydroclones, centrifuges, vacuum and pressure filtration, sand or particulate media filters, expression and other less familiar operations such as the use of coalescers.

The author's intent was to prepare a practical manual for the operating man that would provide a basic understanding of his filtration operation and assist him in improving his plant operation. In doing this, he has accomplished a great deal more and has provided industry with an up-to-date review of most aspects of liquid filtration and liquid-solid separation except conventional screening, together with an introduction to the practical basic theory associated with the various unit opera-