iently compiled encyclopedia of special topics in the field. The unavoidable variation in writing style between papers is a minor annoyance, but the illustrations, indexing, and editing have been well done.

The chapter on dislocations and stacking faults in graphite very thoroughly describes these phenomena and their causes. However, it is obviously not written to be a first exposure to the subject. A prior knowledge of general crystallographic principles and an understanding of the terminology of the specialization are prerequisites for comprehension of the subject as presented.

Inversely, the section on gaseous transport within graphite presupposes no prior exposure to the subject and starts with basic principles. The complexity of diffusion and permeability relationships in graphite is described and experimental techniques are critically evaluated. This paper offers a good introduction and lengthy reference list to those who wish to delve more deeply.

The chapters on the reactions of oxygen-bearing gases with graphite are also somewhat contrasting in content. After an overly long treatment of the formation and observation of dislocations and etch pits, which will be chiefly of interest to microscopists, reactions of molecular and atomic oxygen, alone and in the presence of various catalysts, are concisely discussed. Reactions of carbon dioxide and steam with carbon are given rigorous treatment in a well-organized, very well presented exposition.

The section describing the formation of carbon from gases is that rare gem; a critical and comprehensive evaluation of the literature by acknowledged experts, lucidly and thoughtfully presented. It should be required reading for those with even a peripheral interest in the subject, and will be of value to all workers in the field.

The last chapter describes a method for measurement of thermoelectric power of graphite and relates the use of such measurements to studies of chemisorption of oxygen on graphite surfaces. Although highly specialized and not of general interest to workers in other phases of carbon science, the treatment is thorough and rigorous with respect to the underlying mathematics and physics.

In substance, this book, and probably the series, should be a useful reference for scientists working in and around the physics and chemistry of carbon. It is not recommended for the generalist who desires a broad overlook of the field.

William E. Parker joined the Research Department of Speer Carbon Company, Division of Air Reduction Company, Inc., in 1959, after obtaining degrees in chemistry from Brown University (ScB) and the University of Kansas (PhD) and working several years in the nuclear industry. He has been associated with various phases of carbon and graphite technology, and has published extensively in the field. He is currently Director of Research at Speer.

QUANTITATIVE AND CORRECT

Title Introduction to Special Relativity

Author James H. Smith

Publisher W. A. Benjamin, Inc.

Pages xii + 218

Price $6.00 (clothbound), $2.95 (paperback)

Reviewer John G. Fox

This readable little book is well suited for study by those who wish to acquire "a real working knowledge at an elementary level" of special relativity. That is the author's hope and my belief. It is designed for use as a textbook for physics majors following one semester of freshman mechanics. Pitched at this level, and with its unusually full discussion of concepts, this book should enable almost any technically trained person to become acquainted with special relativity.

The first half of the book is a treatment of fundamental ideas, replete with examples and thought experiments. After introductory remarks on the relativity postulate, with illustrations from ordinary mechanics, there is a discussion of wave motion, light, and the Michelson-Morley experiment—always starting from the most elementary ideas—and the experimental basis for the constancy of the speed of light. The latter is somewhat incomplete, through no fault of the author's, since several papers on this subject appeared while the manuscript was in preparation and production. One might wish that more space had been devoted to the monumental, but unsuccessful, effort of Ritz to save classical kinematics by developing an emission theory of electromagnetism. But this is a matter of taste, and I am perhaps biased. However, it is not correct to say that "if light were a stream of mechanical particles" it could not have wave properties: the stream of water from the nozzle of a garden hose has no trouble assuming wave properties if one jiggles the nozzle. After discussing the speed of light, the author treats such topics as time dilation, length contraction velocity addition, aberration, and the Doppler effect. The discussion, while quantitative and correct, is always full and physical rather than formal. This part of the book ends with an unusually lengthy treatment of the famous twin paradox which, while it has no connection with experiment now or in the forseeable future, always has a special fascination for both layman and professional.

The second half of the book is slightly more formal than the first because it develops some of the analytical tools needed to make calculations for the scattering of elementary particles, nuclear reactions, etc. It will amply repay careful study by anyone who really wants to obtain some *working* knowledge of the subject. First, of course, comes the Lorentz transformation which actually has already been derived unbeknownst to the beginner. Relativistic momentum and energy are defined, and their conservation demonstrated. The center of mass transformation and the notion of four-vectors are introduced and carefully discussed; their usefulness is illustrated by many sample calculations. In the last chapter the author discusses electromagnetic forces and the transformation of the electromagnetic field. This cannot really be left out of a book on special relativity, since this is where the revolution began over 60 years ago. However, the author is probably right in basing his development mainly on mechanics and the Michelson-Morley experiment "on the

grounds that elementary students have little familiarity with or faith in their ability to manipulate fields."

The book is profusely and helpfully illustrated. It has many exercises and problems useful for practice. It can be recommended strongly for beginners either inside or outside the classroom. I also commend it to the attention of many graduate students in physics who, though adept at manipulating the Lorentz transformation, often sadly lack an understanding of the physical meaning of its consequences. They will find that understanding here.

John G. Fox is Professor of Physics at Carnegie Institute of Technology. He received his BSc and MSc at the University of Saskatchewan and his PhD from Princeton University in 1941. His initial research experience was in industry and at the Los Alamos Laboratory of the Manhattan Project. At Carnegie Tech he has worked on the design of that institution's syncrocyclotron for 450-MeV protons and participated in a precision measurement of the relativistic mass increase of fast protons and experiments on proton scattering and meson production. His recent research has consisted of measurement of the speed of gamma rays from a moving source and analyses of the general experimental evidence for special relativity vs emission theories of electromagnetism. He served as head of Carnegie Tech's department of physics from 1955 to 1961, and is a Fellow of the American Physical Society and member of the American Association of Physics Teachers.

AN AID TO COMMUNICATION

Title Dictionary of Chemistry and Chemical Technology

Editors Z. Sobecka, W. Choiński, and P. Majorek

Publisher Pergamon Press, 1966

Pages vi + 1325

Price $30.00

Reviewer L. G. Stang, Jr.

The subtitle of this book, "In Six Languages," might well have been part of the main title because the book is strictly a translator's dictionary. It contains no definitions, only the corresponding terms in the other five languages.

The languages are English, German, Spanish, French, Polish, and Russian. If the inclusion of Polish is a surprise, it is undoubtedly because the editors are Polish and the book was printed in Poland. The only clue as to the editors' affiliations is carried at the bottom of the title page —Wydawnictwa Naukowo-Techniczne, which we suspect means Polish Technical Publishing Institute, although the English translation of these terms is not found in the dictionary itself.

This is a revised edition of the *Dictionary of Chemistry and Chemical Technology in Four Languages*, which was edited in 1962 by Z. Sobecka, W. Biernacki, D. Kryt, and T. Zadrozna with the cooperation of H. Stephen and T. Stephen of Oxford. The revision consists of the addition of French and Spanish equivalents without the alteration of the English entries.

The book appears to be an excellent one. It contains 11 987 primary entries listed alphabetically according to the English term, each one followed across the pair of facing pages by its counterparts in the other five languages. Following this main section is a four-page index of English synonyms for chemical compounds. Next are five indexes, one for each of the other languages, listing each of the entries alphabetically in that language and giving the number of the English entry where the various translations are found.

A quick glance shows that the conventional branches of chemistry are well covered. One finds, as expected, entries for such things as *burette, chromatography,* and *pipette.* Nuclear chemistry and radiochemistry also seem to be covered satisfactorily. For example, there are entries for *alpha particle, beta particle, cross section, daughter isotope, fissile material, fission, moderator, neutrino, neutron, nucleon, nucleus, pile, radioactivity, radiochemical analysis, radiochemistry, radiocontamination, radioelement, radiogenic lead, radiography, radioisotope, radioopaque, reactor,* and *reactor core,* together with many appropriate sub-entries. For instance, under *nuclear* are listed terms such as *bombardment, change, charge, chemistry, energy excitation, fission, fuel, isomerism, level, physics, propellant, reaction, reactor,* and *transformation;* under *radioactive* are entries such as *constant, contamination, decay, disintegration, element, equilibrium, fall-out, indicator, series,* and *transformation.*

It should be noted that English terms that do not have counterparts in one of the remaining five languages are not listed, nor are terms included which are the same in all the languages. This explains the lack of entries for units, e.g., *curie, ampere, torr, fermi,* etc. Nevertheless, there still seem to be a few missing entries. For example, although *counter* and *Geiger-Muller counter* are both listed, *scintillation* and *pulse* or *pulse-height* are not; *proportional* does not appear as a separate entry, although *proportion, proportioner,* and *proportioning* are given (which may be close enough). *Radioactive equilibrium* is listed, but *transient equilibrium* and *secular equilibrium* are not. Under *neutron* are listed *bombardment* and *capture;* however, the only entry for *flux* is one that obviously means soldering flux, rather than neutron flux.

Each of the names of the chemical elements is listed up through *nobellium,* although *lawrencium* is omitted. For element 74, *tungsten* and *wolfram* both appear on the English side, but for element 41, as might be expected, only *niobium* (not *columbium*) is shown.

Not surprisingly (since this is a dictionary of chemical rather than physical terms), only a few nuclear physics terms appear, For example, *meson* is included, but *pion, muon, hyperon,* and *baryon* are omitted. *Model, age, buckling,* and *albedo* are also among the missing entries.

It is interesting to note that a term like *pH-meter* translates as one would expect into *pH-metro* and *pH-mètre* in Spanish and French, respectively, but into the onomatopoetic *Pehameter* in German.

In summary, this would appear to be a valuable addition to most libraries and an indispensable tool for the translator of papers in chemistry.