culture reached an all-time high in some respects and extended its direct influence as far as Egypt. Semitic influence on the Sumerians goes back to very early in the third millennium (possibly even earlier), but it was never on a par with Sumerian influence on the Semites. The mighty Sumero-Akkadian empire of Sargon I and his successors (the 24th to the 22nd centuries B.C.), founded largely on commerce, was followed by the Third Dynasty of Ur (about 2000 B.C.), which was also built on trade and which became the most completely integrated bilingual civilization known to historians. At that time the Babylonians broke away from the "tyranny of words" and developed such disciplines as algebra and philology to a level beyond that of the Hellenistic world nearly two millennia later.

The author has given us a great deal more than is promised in the subtitle; his book is really an attractively presented compendium of Sumerology, which omits technical details. He gives us descriptions of the recovery of the Sumerian language and culture, of Sumerian history, social organization, religion, belles lettres, education, and intellectual and spiritual values, and he sketches Sumerian influence on the ages that followed. In appendixes he gives us surveys of more technical questions, a discussion of such problems as the extent of Sumerian geographical knowledge, and extensive samples, even complete translations, of important Sumerian historiographic and juristic records. Long extracts from Sumerian literature are distributed through the book at appropriate places. No other Sumerian scholar of our time could possibly equal Kramer's total achievement, though he might improve on him here and there. Virtually every printed synthesis of Sumerian civilization is completely antiquated by *The Sumerians.*

Last but not least, cultural and social anthropologists will find a wealth of pertinent material in this recently recovered civilization of the third millennium B.C. Even where translations or interpretations are uncertain or incomplete, we possess the original documents and can always improve on them. And there can never be any question of borrowing from a still older high culture; we assist at the birth of the highest intellectual tradition of pre-Greek times.

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## Success and Security

**The Reluctant Job Changer.** Studies in work attachments and aspirations. Gladys L. Palmer, Herbert S. Parnes, Richard C. Wilcock, Mary W. Herman, and Carol P. Brainerd. University of Pennsylvania Press, Philadelphia, 1962. xx + 225 pp. $7.50.

The authors of this volume have put together four research studies that bear upon the general question of occupational mobility. With divided authorship, but with unity of impact, the monograph points to a high and increasing reluctance on the part of blue collar industrial workers to change jobs and occupations, and the authors attempt to answer the question—Why are these reluctant job changers inclined to stay put? They also wonder about and attempt to resolve an apparent contradiction between this growing indisposition to move onward and upward and traditional subscription to the American Dream of Success.

By means of structured and unstructured interviews, the authors quizzed samples of skilled and semiskilled workmen about their employment experiences and attitudes. Persons selected as respondents were restricted, in the main, to male workers aged 25 to 50, in order to tap that phase of the life span when family responsibilities are heaviest.

One major tentative conclusion stands out in prominent salience in relation to a set of subsidiary conclusions and qualifications, namely, that the reluctant job changer sits tight or, at least, does not change jobs voluntarily, because he cherishes his seniority. Seniority translates into economic security plus various equities and amenities that give life on the production line a modicum of cheer and well-being. Concomitantly, the demurrer perceives only dimly, if at all, a linkage between "onward" and "upward." Opportunities for job or occupational improvement do not seem to be in the range of his grasp. There is no beckoning bird in the bush to tease release of the one in hand. The American Dream, however, has not been abandoned; it has been redefined. Success is Security, the security of a steady job that pays a wage adequate to maintain standardized patterns of consumption. Aspiration for higher occupational status is passed on to the children.

An interesting but not surprising subsidiary discovery is that the company pension plan seems not to increase job attachment. To the industrial worker, $65 per month would appear to be no more exciting in anticipation than the prospect of being 65 years old.

A procedural challenge lies in the authors' consideration of various "indicators" for measuring job attachment. A basic need here is for a set of measures by which various influences on attachment can be expressed in functional relatedness to form a linguistically coherent frame of analysis.

Whatever their technical difficulties and limitations, the researchers have performed a timely service in adding to our understanding of the reluctantly mobile workman before he is removed from the industrial scene by automation.

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## History of Science

**Japanese Studies in the History of Science.** No. 1. Suketoshi Yajima, Ed. History of Science Society of Japan, Tokyo, 1962. vi + 140 pp. Illus. Paper, $5.

The first Nobel prize awarded to a Japanese scientist (in 1949 to the physicist Yukawa) is one landmark in world recognition of the achievements of Japanese science. The geographical expansion of the scientific activity behind this event and the shifts in centers of science during the years from 1500 to the present (treated by Yuasa) is one of the many themes presented in this collection of 21 articles; most of the papers are in English, which is commendably clear and readable, with two in German and one in French. The collection is a welcome and noteworthy introduction to the work of the History of Science Society of Japan, whose members are eager and demonstrably qualified to make significant contributions to cosmopolitan scholarship.

Space limitations permit mention of only a few of the outstanding articles; topics include problems in the history of Japanese, Chinese, and world science; pseudoscience (astrology); mathematics; the philosophy of science; medicine, including occupational diseases; and technology. Saigusa, in a paper entitled "Die Entwicklung der

Theorien vom 'Ki' als Grundproblem der Natur-'Philosophie' in alten Japan," compares the original concept of *Ki* to the Greek *pneuma* and traces its development from the 6th century B.C. to its zenith in the 18th century. Saigusa tells us that, in the 1770's, the concept proved of great use to the first Japanese student of Newtonian gravitational theory, optics, and mathematics (the material was accessible in Dutch versions). Nakayama points out that academic freedom in Japan now permits objective discussion even of such problems as the historical astronomical evidence that contradicts some of the most cherished Japanese historical legends. Watanabe's article on Joule and the dynamic theory of heat invites and deserves careful and appreciative study. Sibuya reveals the extent to which the Japanese recognizes the great significance of the ecological aspects of Darwin's theories. Yajima sketches a survey of the widespread and productive activities of Japanese historians of science, in both teaching and research.

The volume is a laudable publication with which to celebrate the 21st anniversary of the History of Science Society of Japan.

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## Introductory Textbooks

**Spectroscopy**. vol 1, *Atomic, Microwave, and Radio-frequency Spectroscopy* (287 pp. $9); vol. 2, *Ultraviolet, Visible, Infra-red, and Raman Spectroscopy* (412 pp. $12). S. Walker and H. Straw. Macmillan, New York, 1962. Illus.

Spectroscopy today covers a lot of territory. It includes the study by absorption and emission of radiation of intra- and interatomic and molecular interactions in gases, liquids, and solids. For reasons that are well known, each region of the electromagnetic spectrum has tended to become a separate specialty. Many texts and monographs are devoted to each spectral region. Whether or not spectroscopists continue to work exclusively in one region of the spectrum, they need to know and evaluate results from other spectral regions. Therefore students may profit from an exposure in their first spectroscopy course to the types of interactions and the experimental methods of study in nearly all branches of spectroscopy.

The volumes by Walker and Straw are designed to be such an introduction. Volume 1 deals with atomic, microwave, electron-spin resonance, and radio-frequency spectroscopy, including nuclear magnetic resonance and quadripole resonance. Volume 2 covers ultraviolet, visible, infrared, and Raman spectroscopy and includes a chapter on instrumentation and one on applications to astrophysics. The volumes are suitable for use as a textbook for a one-year introductory undergraduate course.

Essentially no quantum mechanics is employed in these volumes; instead, the vector model handling of angular momentum is heavily relied upon. For this reason only derivations that can be obtained by simple vector model reasoning are presented, although important formulas are usually given, even if they are not derived. The main advantage of the volumes is the clear physical descriptions of the essential physical interactions and processes in qualitative terms, which can be and have been studied spectroscopically. Since the number of pages is not excessively large and the topics treated are fairly numerous, the descriptions are brief and to the point, certainly not exhaustive. Thus, one who knows anything about any of the topics treated is not likely to find new material.

In fact, one of the stated purposes is to provide an introduction to the more specialized and advanced texts which treat an individual field of spectroscopy. The volumes cannot be considered as preparation for a book on the level of Condon and Shortley's *Theory of Atomic Spectra*, but they do provide an introduction to such texts as Ingram's *Spectroscopy at Radio and Microwave Frequencies* and Herzberg's two volumes on molecular spectra.

Walker and Straw's first volume strikes me as being more valuable than the second, because it is common and reasonable for students to learn about the vector model in connection with atomic spectra and structure, and then to go on to use similar methods in understanding electron and nuclear resonance. On the other hand, the need for an introductory book that is primarily devoted to molecular spectra is not clear to me. However, some of the features that are presented in volume 2 certainly have current interest —for example, the chapter on fluorescence and phosphorescence (largely devoted to the latter, in connection with studies of the triplet state) and the discussion of the spectra of free radicals and flash photolysis.

The material presented in the two volumes is of interest to both physicists and chemists, although the selection of some of the material presented, as well as that which is omitted, indicates that the authors intended it more for the chemist than for the physicist. Physicists might prefer to find more solid-state spectroscopy—excitons, ferromagnetic resonance, and far infrared spectroscopy, to mention a few.

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## Steroid Chemistry

**Steroid Reactions**. An outline for organic chemists. Prepared by 16 graduate students under the editorship of Carl Djerassi. Holden-Day, San Francisco, Calif., 1963. 657 pp. Illus.

Carl Djerassi set for himself and his contributors a very desirable and demanding goal: to abstract the wealth of valuable synthetic chemistry available in the steroid literature and organize it in such a way that the material would be useful to the practicing "antisteroid" synthetic organic chemists. Given that this is a formidable task, the authors have succeeded remarkably well in producing a reference text that should find its way to the shelf of many practicing organic chemists.

One way to test the value of such a book is to search in it for reactions that will be useful in one's own research. The results of this test were very gratifying. In a number of instances, the volume provided leads to more selective reaction conditions, to different reagents to effect a given transformation, and to analogous reactions that have been accomplished. Several factors contributed to this success: the book's organization (according to synthetic reaction types) makes it easy to locate the pertinent chapter; the near absence of text and the use of many diagrams permits rapid scanning; the clarity of the structural formulas and the generally uncluttered appearance of the pages minimize the