open stands of conifers and aspens; the Eastern Deciduous Forest Province, the largest of the provinces in area, which supports oaks, maples, elms, ash, and other broad-leaved deciduous trees but only pockets of conifers; the Coastal Plain Province, with fire-resistant yellow pines the dominant tree and hardwoods occupying only certain habitats; the West Indian Province, which occurs only in southern Florida and is exemplified by the Everglades; the Grassland Province of central North America, with tall grass, short grass, and mixed grass prairies characteristic of zones receiving successively less annual rainfall; the Cordileran Forest Province, with marked zonation shown by the various conifers at different elevations; the Great Basin Province, with sagebrush, greasewood, and shad-scale as its dominant shrubs; the California Province, with a Mediterranean climate and a complex variety of plant assemblages and soil patterns; and the Sonoran Province, which is confined to the southwestern part of the United States and adjacent Mexico, an area of hot desert where trees are small or are supplanted by shrubs, where there is much unoccupied ground during the dry season, and where annuals are conspicuous for short periods following rains.

Scores of excellent halftone illustrations are distributed throughout the book, and the photographs from which they were made were chosen meticulously. Some show details of fruit, seed, or flowers, such as the cover on this issue of *Science*.

This book is much needed in the American literature dealing with the plant geography of the continent. The authors are to be congratulated on the neat completion of an arduous task. Among botanists and ecologists the task surely will not be a thankless one.

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Mental Disorders of the Aged

Geriatric Psychiatry. Kurt Wolff. Thomas, Springfield, Ill., 1963. x + 125 pp. $5.75.

This book is the fruit of many years of practical experience in the treatment of psychotic geriatric patients. It is not a textbook of geriatric psychiatry. It does not deal with the symptomatology, the course, and the outcome of the mental disorders of the aged. It deals mainly with individual and group psychotherapy of aged patients hospitalized in psychiatric institutions, most of them chronologically old schizophrenics.

Aging is considered a highly individual phenomenon. One specific formula cannot be applied to all people, and the patient and his treatment should be handled by a coordinated approach of the psychiatrist, the internist, and the general practitioner. The biological, psychological, and sociological aspects of aging should be considered.

In individual psychotherapy, Wolff uses the "brief psychotherapy" of Goldfarb and finds it most helpful with patients who present management problems and depressive features. Individual, psychoanalytically oriented psychotherapy was found helpful to 10 out of 14 patients. Extensive case histories and reports of the individual sessions are presented as examples of successful treatment.

Wolff has used group psychotherapy since 1954. During a period of 6 years, he treated 110 geriatric patients by this method in three psychiatric hospitals. The majority (70 percent) of the patients were schizophrenics and had been hospitalized for an average of 20 years; the remainder were organic cases (the average age, 63 years), and 40 were females. Forty percent improved and could be discharged from the hospital. The improvement was evident within 3 months after the group sessions were started. Six months of treatment was necessary to secure a "better emotional equilibrium." Control studies with patients treated by occupational or recreational activities alone revealed the superiority of group psychotherapy as a therapeutic tool. It was also found to be superior to individual psychotherapy, because elderly patients are less alarmed by group treatment than by talking to a therapist in individual sessions.

Countertransference could become a problem, because the therapist may be reminded of his own father or of another important figure in his past life by the patient. Some insight can be achieved, but deep insight is not only impossible, but also undesirable, because it is disturbing to the elderly patient and may increase his symptoms. Support rather than insight is indicated.

Other forms of therapy are dealt with rather briefly by the author. Among these, he is mainly concerned with the use of psychopharmacological drugs in treating agitated, depressed, and withdrawn and apathetic patients, and "milieu therapy"—namely occupational therapy, recreational activities, music, and industrial therapy, educational therapy, and physical and hydrotherapy, and habit training.

In the concluding chapter, entitled "From custodial care toward rehabilitation," the author presents his basic philosophy. The psychiatrist should be able to feel that death is not a cause of fear, but a meaningful rest. He then will be able to really understand his geriatric patients and to show them the way out of emotional conflicts toward freedom, calm, and serenity. The ultimate goal is to restore and keep up the physical strength and vigor of the geriatric patient and to help him regain his emotional equilibrium. The aged patient must again become part of humanity, adjusted to the problems of the progressive world, with faith in himself and in his future.

Those interested in geriatric psychiatry will find in this book many valuable practical hints for the individual and group psychotherapy of aged psychotic patients.

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Chemistry

Friedel-Crafts and Related Reactions. vol. 2, parts 1 and 2, *Alkylation and Related Reactions*. George A. Olah, Ed. Interscience (Wiley), New York, 1964. Part 1, xxx + 658 pp.; part 2, xxvi + 704 pp. Illus. Set, $50.

This is the second volume of a four-volume treatise on the subject. The titles of the sections are "General Aspects," "Alkylation and Related Reactions," "Acylation and Related Reactions," and "Miscellaneous Reactions." It is the stated hope of George Olah, the editor, that the complete series will be published by the end of 1964.

Volume 2 represents a major effort in itself, comprising some 1400 pages and covering not only alkylation of aromatic and related systems, but alkylation of paraffins, haloalkylation, hydrogen exchange, and numerous other related reactions, including paraffin hy-

drocarbon rearrangement and carbonium ion polymerization. It thus represents a thorough coverage of a wide variety of reactions proceeding through carbonium ion intermediates.

As might be expected in a volume that contains chapters written by many different authors, a few chapters are in conspicuous contrast to the majority, which are thoroughly done and well presented. It is somewhat regrettable that the poorest chapter is that on the classical example of the Friedel-Crafts reaction, the condensation of alkyl halides with aromatics.

The book is well printed, largely free of errors, and deserves to be on the reference shelf of any chemist interested in acid-catalyzed reactions proceeding through carbonium ion intermediates.

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Mathematical Recreations

Mathematical Games and Pastimes. A. P. Domoryad. Translated from the Russian edition (Moscow, 1961) by Halina Moss. Pergamon, London; Macmillan, New York 1964. xii + 298 pp. Illus. $5.

This book was written as a sourcebook for games, contests, and extracurricular activities in Russian schools. It includes a great variety of problems, puzzles, number tricks, games, and geometric constructions. Some of the material is already available in other publications, but many of the ideas and mathematical analyses are original. In explaining the mathematical basis for the recreations, Domoryad uses a multitude of mathematical ideas most of which relate to algebra, geometry, or number theory.

The first few chapters deal with system of numeration and topics in number theory. This is followed by arithmetical tricks, puzzles, and shortcuts. Next, winning moves in such games as Nim, Fifteen, chess, dominoes, and magic squares are analyzed. Geometric constructions such as regular polygons and polyhedra, parquets, borders, symmetry, curves, moebius strips, networks, and maps are treated, and some attention is given to cutting and reassembling geometric figures, to the construction of pleasing patterns, and to paper folding. The final sections include a variety of classical problems and puzzles.

The activities presented apply mathematical ideas to an amazing variety of situations. Hence, the book may be used to search for original solutions to unusual problems and theorems. Although some problems are fully analyzed, only references to solutions are provided for others, and unfortunately most of the sources cited are not available in the United States. At the end of the book answers are given for some problems; for others, questions and hints are given to help the reader discover the solution. However, it is very difficult to locate answers to specific problems, because no reference numbers are used.

Since the book was originally published in Russian and was translated by an Englishwoman, many symbols, algorithms, and terms will be strange to Americans. For example, in long division, the divisor is written to the right of the dividend and the quotient below the divisor. A three-digit numeral is expressed as $\overline{a\ b\ c}$, and improper fractions are called "vulgar fractions." The layout, with little variation in format or organization, no color, and no numbered paragraphs for easy reference, gives the book the appearance of a college textbook rather than a book intended for recreational use. The abbreviated proofs, extensive use of symbols, and technical language will make the book enjoyable to the sophisticated reader but may discourage the immature student.

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Geology of Africa

Geological Map of Africa. Prepared by UNESCO and the Association for African Geological Surveys. UNESCO, Paris, 1964 (available from UNESCO Publications Center, New York). 9 sheets and *Explanatory Note* (39 pages). Set, $55.

This spectacular new map covers all of Africa and Madagascar, as well as Saudi Arabia and adjoining parts of the Middle East. It is at once a magnificent base from which to develop the subsurface resources of a continent and a monument of international scientific collaboration. It was compiled by the Association of African Geological Surveys, under the direction of Jean Lombard, on Belgian and French base maps, printed by an Italian firm with UNESCO support, and follows the conventions of the Commission for the Geological Map of the World of the International Geological Congress. Each sheet is an independent unit—sheets 1 to 6, 8, and 9 include their own explanation, while sheet 7 is a more detailed explanation for the entirety. A fuller explanation, summary, and geographically arranged list of sources are provided in the accompanying *Explanatory Note* by Raymond Furon and Jean Lombard, outstanding French students of African geology. The text and explanation are in both English and French. Geographic names and features but no political boundaries are shown. The inclusion of the insular geology and bathymetry of the surrounding oceans enhances the usefulness of this map.

Those familiar with the map of Africa which was prepared by the same association, and published in pieces between 1938 and 1952 by the Bureau d'Études Géologiques et Minières Coloniales in Paris, may well wonder why a new map so soon. Actually the new map represents the same sort of advance over the map published between 1938 and 1952 as the 1957 map of the U.S.S.R. represents over that published in 1937. Intensive postwar geological reconnaissance covering nearly all of Africa is here summarized. Indeed, no other continent has had so comprehensive and detailed an assessment of its substructure at so early a stage in its economic development.

Striking features of the geology of Africa brought out by this map are the prevalence of Precambrian rocks and of continental deposits of all ages. Some 57 percent of the total surface of the continent is underlain by Precambrian, at many places the host-rock for deposits of copper, iron, manganese, gold, and uranium. Continental deposits are abundant from Precambrian to Recent—tillites and associated sediments referred to as the Basal Continental; the so-called Nubian sandstones of Cambrian to Middle Cretaceous age; the red beds, tillites, coal measures, basalts, and the like of the Karroo Series; the "Continental intercalaire," mainly Mesozoic, with plants and dinosaurs; and the fossiliferous "Continental terminal," spanning the Tertiary. Quaternary beds of continental facies are also widespread, including the desert sands of the north