

with finding his way by recounting the many aids that Nature offers. By learning to recognize these natural aids, it is possible to use them as guideposts in pathfinding in remote places.

The author discusses the methods of navigation employed by the early explorers and primitive races who had few, if any, mechanical aids and depended largely on observing natural phenomena. These methods may be employed today in locating position and direction. On the sea, in addition to the position of the fixed stars as direction guides, the author describes the kinds of clouds and their relation to unseen islands. He shows how the characteristics of the winds, the waves, the swells, the migration routes of birds, and even the odors encountered may be significant aids to navigation.

On land, the effects of sun and wind on snow, sand, vegetation, and animal or insect habitats, such as ant hills, are as important to observe as the contours of the hills, direction of water courses, and other natural guides. Keen perception of the stimuli of the five senses and experience in interpreting these stimuli can convey the impression of a mysterious sense of direction in an individual so schooled. However, the author rejects the theory of any such sixth sense.

This is a fascinating as well as an instructive book. In the 25 chapters the almost countless problems involved in successful route-finding over water and snow, in forests, deserts, mountains, and even in cities, are presented. Of special interest are the chapters devoted to the habits of sea birds.

A foreword to the book has been written by Lieutenant General J. H. Doolittle, who recounts the many years of service that Harold Gatty rendered to the U.S. Army Air Corps when he was in charge of air navigation research and training.

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Kurds, Turks and Arabs. C. J. Edmonds. Oxford University Press, London, 1957. 435 pp. Illus. \$6.75.

The expectant reader will find very little here concerning Turks and Arabs—hence the title, while perhaps well meant, is somewhat misleading. However, there are many data about the Kurds, a people on whose history and culture Edmonds is a recognized authority. We are treated to a discussion of “politics, travel and research in north-eastern Iraq 1919–1925,” and of events in southern Kurdistan impinging heavily on the Mosul question, involving Great

Britain–Iraq and Turkey. Edmonds was political officer in the disputed Mosul province.

C. J. Edmonds is one of those dedicated British civil servants who has given the best years of his life in the service of his country abroad, spending the greater part of his fruitful career in Iraq. In its discussion of the events leading up to the Mosul question, the book is extremely useful for its presentation of the British point of view, as seen through the eyes of one of the principals. Edmond's expert opinion made him a logical member of the Anglo-Iraqi delegation on the commission appointed by the League of Nations to investigate the dispute and to recommend a solution. Contrary to a statement made by another author—and incorporated in this book (page 434, footnote)—to the effect that the strong vested interest of the British in the oil of Iraq was a major factor in the decision, one is surprised to note Edmond's reflection that oil was not a matter of “outstanding importance” at the settlement of the Mosul dispute. At any rate, it is to be credited to the British that, through their influence, Mosul was not separated from the Baghdad and Basra provinces—a circumstance which made the state of Iraq a viable entity. Edmonds, who was adviser to the Ministry of Iraq from 1935 to 1945, has supplemented his field knowledge with the temper of time and perspective. One regrets that he could not bring us up to date on events which figure so much in the current dispatches.

Scholarship and mastery of source material are evident in this book. There is a fund of bibliographic references for the student to check for himself. Drawing upon personal diaries and documents available to him, Edmonds pays fine attention to details. Antiquities and archeology, ethnographic history, genealogy, geography, politics, and intrigues are all interwoven into a delightful *mélange*. And when the reader tires of the recitation of journeys through endless strangely named villages and ranges, he will be able to find diversion in Edmond's translations of Kurdish poems, each one a treasure.

In relentless pursuit of law and order, the indefatigable political officer was equally at home in the saddle or in the slip stream in an open cockpit. We are amazed at his account of the Hollywood-like escapades of a particularly unruly Kurdish sheikh from Sulaimani, who on one occasion absconded with the treasury, the municipal printing press, and a body of native troops in order to wage a personal propaganda war for independence. This thorn in the British side always managed to escape when the net grew too close for him or when the punitive airplane bombings proved especially

distracting. Interspersed in Edmond's account are nostalgic memories of holiday parties and hunts that tided him over the duller moments.

One receives the impression that Edmonds has pulled together his past published material for this work, with new additions, and that this offering is his last word on the subject. Let us hope that this latter is not true, and that we shall hear more from him soon.

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Physik und Technik der Atomreaktoren.

Ferdinand Cap. Springer, Vienna, Austria, 1957. xxix + 487 pp. Illus. \$15.25.

This is a first attempt to publish in the German language a book covering the entire subject of reactors from the point of view of physics and engineering. The book is based on lectures given by Cap at the University of Innsbruck (Austria). The level of the book lies somewhere between that of a textbook for students of reactor engineering and a source book for specialists. It will serve as an introduction to the subject, but the serious student will find it necessary to refer to the original literature. The extensive bibliography will aid him in such efforts. Many problems are offered at the end of each of 49 sections. The loose enclosure of four pages of corrections will give the reader satisfaction if he is hunting for further misprints.

In chapter 1 the fundamental aspects of nuclear physics are presented: the mass formula of Bethe and Weizsaecker, a treatment of radioactive decay, nuclear reactions, the Breit-Wigner formula, cross sections, neutron physics, fission, and fusion of nuclides.

Chapter 2 is devoted to a description of the energy losses of neutrons, elastic and inelastic scattering, energy distribution after a collision, slowing down in hydrogen and other materials, influence of resonances and temperature, and neutron chain reactions.

Chapter 3 discusses the theory of neutron diffusion. Transport theory is used only in the introductory section of the chapter and for improvement of more approximate results. Two sections about diffusion with slowing down and Fermi age theory close this chapter.

From chapter 4 on, the book deals with reactor applications. Homogeneous reactors are dealt with in chapter 4. Some of the topics offered are the critical volume of a one-group reactor, its criticality equation, reactors of different shapes, multigroup theory, influence of a reflector, dynamical behavior of re-

actors, their period and oscillations, and prompt and delayed neutrons.

Chapter 5 covers the theory of the heterogeneous reactor. The construction of reactors with different kinds of fuels, moderators, reflectors, and heat transport is discussed in chapter 6. Reactor operation and control and the burning up and poisoning of the fuel (and its regeneration) are the topics dealt with in chapter 7. Several types of reactors are described in chapter 8—especially light and heavy water as well as graphite moderated reactors. A survey of the use of reactors for research, education, and medical applications, for the production of fuel, isotopes, energy, and propulsion, and for industrial purposes is given in chapter 9. This chapter closes with a discussion of questions of law and organization.

Tables of contents, tables, figures, a glossary of symbols, and a large index are included.

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