

ricultural cooperatives is proposed (chapter 5); whether native governments can do what, it is inferred, they need to do to launch an effective cooperative movement is by no means certain. The essentiality of birth control is recognized (chapter 6), though not, perhaps, the need for immediate and effective action if "peasants" are to be freed from the "incubus" of the stork as well as from that of "land-owners and grasping middlemen"; "birth control" is inaccurately described as "expensive," even though the high return on investment in voluntary sterilization and other control measures has been well demonstrated.

Major though not exclusive emphasis is placed upon investment, of which about \$30 billion is needed annually, given a capital-output ratio of 4, population growth of 2 to 3 percent per year, and an increase of 4 to 5 percent per year in per capita income (chapter 7). The underdeveloped countries can supply some \$10 billion (chapters 7 and 8); hence presumably the developed world, now supplying about \$6 billion public and \$2 billion private funds, might furnish much of the balance (chapters 9 and 10).

Moussa suggests that *total* investment in French Tropical Africa continues to approximate 3.2 times French public investment in this region (page 91), even as total income approximates 3.2 times primary income. The role of private investment seems to be underestimated (chapter 10), though profit-sharing formulas are discussed (chapter 3), and the adverse effects of recent expropriation are noted. Moussa notes that public and private investment are complementary, but he neglects another aspect: because public and private investment also compete for available savings, adequate investment criteria are needed.

Technological and intellectual aid, along with psychological and political conditions, are discussed. While aid is described as a "world problem," greater emphasis is put upon the "political stakes" for which East and West supposedly are competing. Sources of waste in foreign aid programs are neglected; and no cold assessment is made of the supposed "political stakes" that underdeveloped countries now play to such good advantage.

JOSEPH J. SPENGLER

*Department of Economics,
Duke University,
Durham, North Carolina*

26 OCTOBER 1962

Sinhalese, Tamil, and Veddah

The Physical Anthropology of Ceylon.

Ceylon National Museum's Ethnographic Series Publication No. 2. Howard W. Stoudt. P. E. P. Deraniyagala, Ed. The Museum, Colombo, Ceylon, 1961. 180 pp. Rs. 7.50.

The appearance and disappearance of exotic peoples who inhabit large areas is frequently best studied in smaller refuge areas where both immigrations and the subsequent circumstances of their evolution are more starkly delineated. Ceylon, like Madagascar and Greenland, is such an insular laboratory, and it has been judiciously utilized to explore the human biology and population history of its inhabitants. The basic anthropometric data on which this volume is based were collected by J. R. de la Haule Marett, prior to World War II, in which he lost his life. Fortunately the value of the study was appreciated, and the data were sent to E. A. Hooton. After Hooton's death, W. W. Howells and E. E. Hunt made the data available to H. W. Stoudt. P. E. P. Deraniyagala, W. M. Krogman, and C. S. Coon provided substantial assistance in seeing this study brought to a successful conclusion a quarter century after its inception.

At the time of the first European conquests, Ceylon was occupied by three racial groups: Sinhalese, Tamil, and Veddah. Veddoid peoples have long enjoyed popularity in anthropological literature, in part because of their similarity to Australian aborigines and their morphological antiquity. Now, for the first time, an adequate series of Veddahs is described, and evidence is presented that this original group is disappearing as a result of intermixing with Sinhalese and Tamils. Reduction of the death rate by elimination of malaria, coupled with a high birth rate, is producing a high rate of population growth for the island as a whole. This study of morphological variation provides an indispensable benchmark for future assessments of the population.

There is an especially sophisticated discussion of problems of morphological differentiation, with attention to genetics, physical environment, cultural environment, diet, and nutrition. A section on breeding habits, with tabular analyses of biological and geographical relationships of the subjects'

parents and of the frequency of mating between the various village and caste groups, firmly establishes, in quantitative fashion, the Mendelian nature of the groups measured.

Among the findings are a tendency toward Mongoloid characteristics at higher altitudes, the absence of an expected size increase in recent Tamil immigrants, larger body size in areas that have soils of limestone origin, stature increase resulting from heterosis, and greater geographic variation within castes than between castes in the same area. Human biologists and ethnologists will find a wealth of good data and interpretation on the several groups of this expanding island population.

W. S. LAUGHLIN

*Department of Anthropology,
University of Wisconsin*

Standard Text Revised

Introduction to Physical Geology. Chester R. Longwell and Richard F. Flint. Wiley, New York, ed. 2, 1962. 504 pp. Illus. \$7.95.

The greatest changes in this second edition of one of the most successful textbooks on physical geology are in the overall size and format, in the number of illustrations (increased by about 50 percent), and in the price (also up about 50 percent). Of these changes, the increased illustrations will be the most welcome, because this book now ranks as one of the best illustrated texts in the field.

The order in which the material is treated is standard. The authors have added material in places and thus have enlarged the book over the original edition (1955), but the organization remains the same. This has tended to make the book more detailed without making it more technical, and some geologists will regret the failure of the authors to really integrate modern chemistry and physics into physical geology. This criticism, however, can be applied to all of the books in this field. What seems to be needed is the weaving through the text of some fundamental principles, such as viscosity and the concepts of equilibrium and stability. The authors have attempted this, but more thorough revision is needed. Terms are defined in the text, and a glossary is omitted. Unfortu-

nately, the authors have not made obvious use of the geologic glossary published by the American Geological Institute, and a few of their definitions are contrary to common or proper usage. Individual topics that might be discussed in more detail include rock mechanics, the origins of caves and coral reefs, types of glacial deposits, continental drift, and oil shales. The material in chapter 12, dealing with lakes and basins, might be worked into other chapters. Topics that are treated especially well include geologic time and the evolution of coastlines.

Very careful editing has eliminated virtually all errors and has produced a most attractive volume. Undoubtedly the book will continue to be widely used as a text in beginning geology courses.

BATES MCKEE

Department of Geology,
University of Washington

British Topographic Botany

Flora of the British Isles. A. R. Clapham, T. G. Tutin, and E. F. Warburg. Cambridge University Press, New York, ed. 2, 1962. xlvii + 1269 pp. Illus. \$13.50.

Atlas of the British Flora. F. H. Perring and S. M. Walters, Eds. Nelson, New York, 1962. xxvi + 432 pp. \$22.50.

Modern topographic botany had its origin in the British Isles with the work of Hewett Cottrell Watson. Now, 130 years after Watson's first book was published, two very fine additions to the literature on this subject have been made. Because of their background of intensive floristic work, British taxonomic botanists have sometimes been accused of being parochial in their outlook, but their concentration upon the details of local floras shows up to great advantage in these two books. Also, by including the results of recent monographic work, wherever this seemed reasonable, information on the taxa here recognized has been readied to take its place in the forthcoming *Flora Europaea*.

"Clapham, Tutin, and Warburg" became standard as soon as it was published in 1952. In this second edition, more information on the species has been added, even though the total number of pages has been reduced by the

use of a larger format. In addition to very full morphological descriptions and accounts of range and ecological preference, the authors give flowering dates, pollination biology, seed or fruit dispersal systems, chromosome numbers, and, finally, the Raunkiaer life form. It is hard to suggest what more could be added without going to the detail of the "Biological Flora of the British Isles," another worthy effort that is being published, species by species in the *Journal of Ecology*. In addition, several of the keys have been considerably modified in this edition.

Naturally, the authors point out that, despite the combination of intensive experimental field and herbarium studies of variable species and "critical groups" during the last decade, much remains to be done. Nevertheless, it is probable that for many years this excellent *Flora* will be used with appreciation by all who have cause to work on the British flora and by many whose concern with it is incidental.

Our knowledge of the distribution of vascular plants in Britain has also been materially improved in the last 10 years, largely as a result of the field work undertaken in connection with the "Distribution Maps Scheme" of the Botanical Society of the British Isles. It is, therefore, particularly pleasing to be able to have the results of this admirable scheme available at the same time as this second edition of the *Flora*.

In the production of the *Atlas of the British Flora*, the energies of Britain's indefatigable band of amateur botanists have been harnessed to the successful performance of an immense task. It is the admirable function of the Botanical Society of the British Isles to bring amateur and professional botanists into close and productive contact. The happy result of this collaboration is a beautifully produced series of "dot" maps that treat all generally accepted British native species (excluding critical segregates) and most well-established introductions.

For the purpose of producing the maps, the country was divided into ten-kilometer squares of the National Grid, and these were allocated to one or more individuals or societies for listing the flora on standardized cards. Special expeditions were organized to remote areas to fill those cards that would otherwise have remained incomplete. In addition, herbarium records were used, so that recent changes of range might be indicated to some extent, and all

critical species were checked by a large roster of experts. The maps were then produced with the aid of automatic machines. To assist users of the maps, a pocket in the back of the book contains a series of transparent overlays that help greatly in suggesting the possible natures of limiting factors in the distributions of particular taxa. These overlays represent, respectively, the river systems, vice-counties, altitude, temperatures at different times of the year, geology, humidity, rainfall, grid squares, and, for the benefit of those who would work further, "under-worked squares." There is also a most interesting account of the manner in which the scheme was put into operation. Hopefully, this will suggest means whereby it might be possible to follow a similar pattern of work elsewhere, even in North America.

H. G. BAKER

Department of Botany,
University of California, Berkeley

General Chemistry Texts

The Nature of Atoms and Molecules.

A general chemistry. Ewing C. Scott and Frank A. Kanda. Harper, New York, 1962. xii + 765 pp. Illus. \$8.

Fundamental Chemistry. Donald H. Andrews and Richard J. Kokes. Wiley, New York, 1962. xv + 814 pp. Illus. \$7.95.

These two new general chemistry texts differ widely in the scope and sophistication of the material presented. The authors of each claim that their book assumes no previous training in chemistry or physics.

The Nature of Atoms and Molecules is the more traditional in approach to the subject; more than half of its chapters and two-thirds of its bulk are devoted to descriptive chemistry of the elements. Much space is devoted to the history and occurrence of the common elements and to the uses and industrial processes associated with them. The authors employ electronegativity as their major tool in explaining chemical reactivity. There is little attempt to show relationships between chemical behavior and thermodynamic and kinetic factors. The chapters on the metals each contain a section on analytical properties. Organic chemistry is treated briefly in the same chapter with the inorganic chemistry of carbon. A chapter on giant molecules