

views. It provides authoritative and up-to-date essays which describe techniques for studying the sex chromatin body and the human chromosomes, techniques that have been successfully utilized in well-established and experienced laboratories. The contributors, all authorities in the field, have necessarily favored their own methodologies, occasionally to the neglect of others that are equally effective.

The chapter on the sex chromatin is thoroughly and lucidly handled. Murray Barr quite properly stresses the necessity of not trying to interpret specimens of inferior quality. The use of such specimens is undoubtedly the major cause of incorrect reading of chromatin preparations. I would not agree with Barr's statement that "no other form of the test is as applicable to newborn surveys as buccal smears," for, in my opinion, the amniotic membrane technique is indeed preferable, particularly for surveys on large populations. I wish that Barr had made it clear that there is no reason to assume an intrinsic difference in the sex chromatin of normal newborns.

Mellman's chapter on the culture of peripheral leukocytes, Harnden and Brunton's chapter on culture of skin cells, and Schmid's on autoradiography are practical and competent descriptions of various techniques used in fields that abound in modifications.

Two outstanding discussions are the comments by Tjio and Whang on direct bone marrow preparations, and that by Ohno on the direct handling of germ cells. These techniques, both of which are of increasing importance to the cytogeneticist, are succinctly described and well illustrated. Similarly, the chapters on microscopy and photography fill a real need for those who are attempting high resolution microscopy for the first time.

Patau's paper emphasizes his views about the uncertainties that still remain in the identification of the human chromosomes. Despite its many imperfections, however, it is worth reiterating that the "Denver system" is still the best method by which scientists can communicate their chromosomal findings.

The final chapter, "Human chromosomes in disease" by Yunis, contains much information, but a paucity of constructive generalization that might be helpful to the audience for which it was intended.

In summary, this monograph should prove extremely useful to the tyro in

cytogenetics; this is particularly true of the first eight chapters which adhere to the aim of the book—that is, to discuss methodology. I commend to readers the last paragraph of T. C. Hsu's introduction in which there is a reminder that mastering techniques alone does not make one a competent cytogeneticist. This reminder is particularly important for medical groups who wish to start a laboratory in cytogenetics.

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Combustion Institute Symposia

Tenth Symposium (International) on Combustion (Cambridge, England), August 1964. Organized by the Combustion Institute, Pittsburgh, Pa., 1965. xxviii + 1488 pp. Illus. \$35.

The prestige and scientific importance of the biennial international symposia organized by the Combustion Institute are now so well established that nearly every active worker in the field, from every part of the world, is anxious to present his latest experimental or theoretical results at these meetings. It follows, therefore, that all those who have more than a passing interest in this field should have the proceedings of the symposia close at hand.

The proceedings of the Tenth Symposium (International) on Combustion meets the high standards set by its predecessors and in some ways exceeds them. One hundred and thirty papers from ten countries, together with the comments made on each paper, have been assembled in this one volume; the papers are in good to excellent English and with singularly few apparent errors. More important, the quality of the work presented is in most cases extremely high. I venture the opinion that it would be impossible to find an equal number of consecutive pages of any scientific journal containing such a high proportion of new data, important experiments, critical analysis, and theoretical advancement.

The broad divisions of subject matter include flame chemistry, kinetics of reactions related to combustion, electrical properties of flames, detonation, flame spectroscopy, fire research, aerodynamics in combustion, and solid pro-

pellant burning. But these broad classes hardly suffice to indicate the great variety of topics considered—topics ranging from the augmenting of flames with electric discharges to the rate of growth of soot, or from the generation of pressure waves by accelerating flames to the identification of negative flame-ions. A few topics, which were well covered in the ninth symposium, are intentionally omitted here; these are modeling of combustion processes, reactions and phase changes in supersonic flow, and reciprocating engine combustion.

For the first time, the Combustion Institute has acted as its own publisher; the result is gratifying, not only in the book itself but also in that the elapsed time between symposium and publication is the shortest within recent memory. Another innovation, one that is worth the price of the volume, is the inclusion of cumulative author and subject indices for the first ten symposia.

This volume and the several preceding it constitute a refutation of the thesis that no worthwhile thing can come from a committee; scores of people, all listed in the introductory section, labored to make the symposium a success. Perhaps special recognition should be given to Raymond Friedman, who headed the large group that selected the papers presented from the much larger number of papers that were submitted, and to Walter G. Berl for the work of his committee in editing and publishing this very worthwhile volume.

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Acridology

The African Genera of Acridoidea.

V. M. Dirsh. Published for the Anti-Locust Research Centre by Cambridge University Press, New York, 1965. xiv + 579 pp. Illus. \$37.50.

Since its establishment in 1945 the Anti-Locust Research Centre (London) has consistently sponsored basic systematic research on grasshoppers, in addition to much work on bionomics and applied aspects. Work on the grasshoppers of Africa has been conspicuous, probably because of the rich and poorly known fauna of that continent, the involvement of several species of

migratory grasshoppers (locusts), and the importance of this fundamental work to the agriculture of numerous developing countries. In 1956 the Centre published H. B. Johnston's *Annotated Catalogue of African Grasshoppers*, a tremendously valuable compilation of the literature through 1953. Now it has followed with this guide to the identification of the genera, and it is stated that the first of several supplements to the *Catalogue* is in preparation. Thus, during a period of about 10 years, the tools to aid in the identification of African grasshoppers and in locating the literature on each kind have been dramatically improved.

The author of this new book, V. M. Dirsh, chief systematist of the Centre, has produced identification keys to the 472 genera. For each genus, there is a concise modern description and a list of the species considered valid for Africa; for each species, the African

countries from which it is recorded are listed. There is a total of 1882 species. As the title implies, the emphasis is on genera—there are no keys to species. However, numerous genera require revision before anyone could offer practical species keys. The illustrations, made by four different artists, are an outstanding feature, representing all but 11 of the genera. Contributing to the clarity of the book is the well-illustrated introductory section on terminology. This book is a landmark in acridology, and its author and sponsoring organization deserve great credit.

Potential American buyers may be startled to learn that the listed price (\$37.50) is considerably higher in dollars than in English currency; the equivalent of £10 pounds is \$28.

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Low-Temperature Geochemistry

Geochemistry of Sediments: A Brief Survey. Egon T. Degens. Prentice-Hall, Englewood Cliffs, N.J., 1965. x + 342 pp. Illus. \$13.25.

Geochemistry of Sediments: A Brief Survey is, according to its author, "an introduction for students of geology into the fundamentals of low-temperature geochemistry. Its principal objective is to demonstrate how geochemical data can supplement geological field work or assist in petrographic and paleontologic research." With these stated purposes Degens has set out to fill a gap in the spectrum of existing geological textbooks. By and large he achieves these purposes very well. The range of content of the book is general, and it is written in such a way that one studying in a relatively unrelated scientific field can read and comprehend it with little difficulty. The topics covered are of basic interest and are not overly specific. This is not to say that the contents are superficial. It is to say that Degens has written successfully for his intended reader.

The systematically organized contents proceed from an introductory chapter to a discussion in chapter 2 of the weathering residues of igneous and metamorphic minerals. Chapter 3 deals with minerals of low tempera-

ture and aqueous formation, with sections on silicates, oxides and hydroxides, carbonates, phosphates, sulfides and sulfates, and halides. Chapter 4 relates to mobile phases and contains an adequate discussion of the role of water and a somewhat abbreviated discussion of the role of gases and petroleum. Chapter 5, "Organic chemistry," treats of concepts of biogeochemical studies, classification of organic substances, distribution of carbonate isotopes and organic minerals, and geochemical data and concepts on the origin of organic matter, the latter including primordial "organic" matter, petroleum, and coal. Chapters 6 and 7 consist of a brief coverage of miscellaneous topics and a summary and outlook.

The format of the book is pleasing, the text well written, and the illustrations clear and in sufficient quantity to elucidate the various topics covered. Each chapter is followed by an ample list of selected references that appear to contain reasonably current citations where they are pertinent.

For the nonspecialist who wishes an entree into the field, this book will provide good background. For the researcher who has a somewhat more sophisticated knowledge of the literature and current research in this area, it will be less useful. However, the

latter should remember that Degens did not set out to write an advanced treatise, but to introduce the nongeochemist to certain aspects of the field. To this end the book fulfills a need, and *Geochemistry of Sediments* is recommended as an addition to the library of the nonspecialist.

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Paleobiogeography

The Geography of Evolution: Collected Essays. George Gaylord Simpson. Chilton, Philadelphia, 1965. xiv + 249 pp. Illus. \$5.50.

It is well known that geography was midwife to evolution, for the facts that led Darwin to reject special creation of species were all geographical: representative species in different areas of a continent; related fossil and surviving species in the same continent; the South American character of Galápagos finches; and the geographical apartness of those islands. Less well known to those who are not specialists in paleontology and biogeography is the astonishingly high degree of precision which these fields of study have now reached, largely owing to George Gaylord Simpson's work. In this admirable collection of essays, Simpson shows how use can be made of actual measurements of taxonomic diversity between continental faunas, time-records of major groups of mammals, measurements of amounts of faunal interchange between continents at different periods, and indexes of faunal resemblance, also at different periods.

An illuminating analysis of possible paths of migration into corridors (which allow balanced faunas to pass in either direction), filter-bridges (which allow filtered and therefore unbalanced portions of faunas to pass), and "sweepstake-routes" by "island hopping" (on the probability of which the odds of passage can be calculated), not only explains the differences between basic continental faunal types, but also makes paleobiogeography an objective science which is no longer a field for speculative subjective preferences. It also enables biology to repay its debt to geography because it provides the best evidence available on the permanence of ocean barriers represented by their impassability. This is in accordance with the