

R. Ruibal of the comparative behavior of West Indian anoles, K. S. Norris's thoughtful discussion of color adaptation and thermal relationships in desert species, and Dawson's interesting exposition of the physiological responses of lizards to temperature.

While much of the current work on lizard ecology appears in the herpetological journals, a great deal is scattered, and to date no reviews or summaries have appeared, although one is in press. The interested scientist has been at a distinct disadvantage in his attempts to explore this new literature. This symposium fills this gap, and even if more general review works should be forthcoming, the serious lizard ecologist will turn again and again to the major contributions which appear here. For this reason the tables and graphs which are so liberally used are particularly welcome.

It should also be pointed out that the entire symposium as it appears in this book was carefully and effectively planned out and presented. This isn't a loose collection of papers covering a wide range of subjects, but a highly selected and integrated presentation of the ecological research most energetically being pursued at the present time.

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## Biological Macromolecules

**Conformation of Biopolymers.** Papers read at an international symposium, Madras, India, Jan. 1967. G. N. RAMACHANDRAN, Ed. Academic Press, New York, 1967. Vol. 1, xiv + 425 pp., illus., \$19.95; vol. 2, x + 356 pp., illus., \$14.75.

As is well known, proteins and nucleic acids are polymers of relatively simple molecules joined together by chemical bonds to give long chains. Their biological functions are directly dependent on the conformations in which the chains exist—that is, on the specific manner in which the chains are folded and twisted in space. The folding and twisting are brought about by the action of various kinds of intra- and intermolecular forces, such as hydrogen bonds and van der Waals forces, involving both the polymer molecules themselves and the solvent molecules that surround them. The study of the conformations of biological macromolecules is not easy, but powerful tools are available and a great many people are involved

in efforts to apply them to the problem. Recent progress has been rapid, but it will surely be many years before we have answers to many of the questions that can now be asked.

The two volumes under review contain 48 papers, all of which are progress reports on recent research in the laboratories of the participants in the Madras symposium. Of the 48 papers more than three-quarters are concerned with problems related to protein conformations; the remaining papers deal with the somewhat simpler problems of the conformations of nucleic acids and polysaccharides. Some of the papers contain material that will be of interest to biochemists in general, but most of them are clearly intended for the specialist.

Emphasis has been placed on the following particular physical and theoretical approaches to the problem of protein conformation: the restrictions imposed on conformations by steric repulsions and by the potential energy of interaction between nonbonded atoms along the polymer chain (three papers); the interpretation of optical rotatory dispersion and circular dichroism (six papers); and the statistical mechanics of polypeptide and protein chains and cooperative transitions between different conformations of these chains (four papers). Nine papers are devoted to the special conformational problems encountered in polymers containing large amounts of proline, and in particular to the unusual and fascinating protein collagen. Relatively little space is devoted to the vast amount of detailed information on protein conformations that is now rapidly becoming available through the application of x-ray diffraction to crystalline globular proteins. Only passing attention is given to the confusing and vexing—but important—question of the role of the solvent in determining macromolecular conformations.

The Madras symposium was presided over by Linus Pauling. His interesting historical account of the study of protein structure at Caltech serves as an introduction to the collection of papers.

These volumes will be a useful addition to all libraries intending to maintain a reasonably complete coverage of current work on the physical chemical study of biological macromolecules.

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## Identification Guide

**The Particle Atlas.** A Photomicrographic Reference for the Microscopical Identification of Particulate Substances. WALTER C. McCRONE, RONALD G. DRAFTZ, and JOHN GUSTAV DELLY. Ann Arbor Science Publishers, Ann Arbor, Mich., 1967. xvi + 406 pp., illus. Boxed, \$125.

A few weeks before receiving *The Particle Atlas* for review I saw the advertising brochure describing in glowing terms this "scientific achievement to add new reliability to your library or laboratory." "Here is the way you can identify almost any particle you can detect," it continued. I am tempted to quote more from this masterpiece of the advertising art in "full color," but my readers are probably more interested in the contents of the book itself.

Let us start by saying that the atlas is a beautiful book. The printing house strove for an "art book" type of presentation, and with reasonably good success (in the review copy there are two or three pages on which the blues are somewhat out of register). The book contains over 500 color micrographs of all kinds of particulate substances, the particles ranging in size from only a few microns to about 100. All the techniques which can enhance color in the light microscope have been exploited. The micrographs are shown at magnifications ranging from 40 to 500, with two at 900. The authors would have done well to omit these last ones, which are vivid unintentional illustrations of the so-called "empty" magnification.

For whom is the *Atlas* produced? The foreword identifies the potential users as persons working in air-pollution control, industrial hygiene, clean-room monitoring, and criminalistics (*sic*). To this list the advertising folder adds about ten other groups, among them workers in agriculture, food processing, metallurgy, and parenterals. Whoever the prospective users may be, the authors must expect them to have little knowledge of microscopy, for they have included a 23-page elementary presentation of such subjects as the refractive index, crossed polars (I dislike this expression, which seems to be gaining favor in certain circles), dispersion staining, measurement of physical properties, x-ray powder diagrams, the electron microscope, the electron microprobe, and so forth. On the whole the presentation seems suitable for those without college training.