

The preponderance of illustrative material from Pacific coast flora may limit the book's utility outside that region, although some may consider its restricted taxonomic and geographic scope a pedagogic virtue. Six pages are devoted to cytological technique, yet chromosomes are illustrated in only one figure and are discussed rather briefly (despite a chapter entitled "Data from cytogenetics"). There is a fine dedication to Harvey Monroe Hall, an American pioneer in the field of biosystematics, who was responsible for the direction taken by a considerable portion of taxonomic research carried on in the United States during the middle decades of this century. Curiously, however, Benson devotes little space to the school of genecology inspired by Hall and Göte Turesson or to the work of Hall's colleagues and successors—Clausen, Keck, and Hiesey.

Among this book's assets are the copious and excellent illustrations, the portions dealing with description and documentation, and the comprehensive up-to-date bibliography. The book is an honest and sincere presentation, but its unevenness may prevent its wide use as a text and thus cause it to miss the audience for which it is primarily intended. It should be read by every botanist interested in systematics, for it is a readable résumé of Benson's own work on oaks and buttercups.

ROBERT ORNDUFF

*Department of Botany,
Duke University*

I.Q., an Oversold Concept

Creativity and Intelligence. Explorations with gifted children. Jacob W. Getzels and Philip W. Jackson. Wiley, New York, 1962. xvii + 293 pp. Illus. \$6.50.

This book reports an important piece of psychological research carried on in the late 1950's at the University of Chicago. As the phrase "gifted children" will suggest to those who are familiar with the psychological literature of the past 40 years, the study stems basically, although at some distance in time, from Lewis M. Terman's pioneer work with gifted children (defined as children with an I.Q. of 140 or greater) in California. The Getzels and Jackson study is also, and perhaps this is its greatest significance, an astringent corrective to the

oversold concept of the I.Q. and its accompanying test paraphernalia. The I.Q., in the hands of officious school counselors and credulous school administrators and teachers, has for several decades cowed children and their parents with the idea that the quantity of a fixed, real, given-by-nature, precisely measurable, and important trait called intelligence, to which a single number could be attached, had been ascertained with exactness in that particular child's case. And of course it was almost as bad to have a very high I.Q. as it was to have a very low one; in either event, the expectations were definite, and the student's self-esteem inevitably suffered abrasions at some time or other.

Getzels and Jackson were by no means the first psychologists to recognize the folly of this system, nor for that matter were they first to carry out investigations establishing the relationship of measures of general intelligence to measures of creativity. Their contribution lies rather in their dramatic use of the test results, especially in the telling individual cases they report, and in their informed and penetrating discussion of the issues upon which their data shed some light.

The data themselves consist of intelligence test scores, creativity test scores, and measures of scholastic achievement of some 500 boys and girls in grades 6 through 12 in a private school in the Chicago area. On the basis of a rational combination of the intelligence test scores and the creativity scores, two small groups, of 26 and 28 students respectively, were designated as "High Creativity" and "High Intelligence." These two groups, which proved to be about equal in academic achievement in spite of marked I.Q. differences, were contrasted in terms of values and of cognitive style exhibited in other test performances. The "high creativity" subjects showed significantly more humor, playfulness, incongruities, unexpected endings, and stimulus-free (as opposed to perceptually rigid or stimulus-bound) themes in the stories they invented, and more violence as well, it may be noted. In values, "high intelligence" subjects put more emphasis upon conventional success and upon conformity to adult values as desirable goals.

The data are slight in themselves and would not warrant the far-reaching interpretations the authors have placed upon them were it not for their internal consistency and sensibleness as well as

their neat dovetailing with a host of other findings that are emerging from an impressive volume of recent research on creativity in a wide variety of settings. Getzels and Jackson seem to have summed up the tenor of much of this recent work in their own study.

FRANK BARRON

*Institute of Personality Assessment
and Research, University of California,
Berkeley*

Cancer Cell Behavior

An Introduction to the Biochemistry of the Cancer Cell. Harris Busch. Academic Press, New York, 1962. xiv + 424 pp. Illus. \$13.50.

In this timely book Harris Busch has attempted to look at the cancer cell in the light of the impressive strides made in biochemical genetics during the past decade. It is not surprising that the discussion is limited in its scope, since consideration of the cancer cell is equivalent to the consideration of the whole field of cellular biochemistry. Busch has focused his attention here on aspects of cancer cell behavior. He considers the chemistry of nuclear structures and their roles in protein synthesis, and he draws heavily on his own studies on the chemistry and metabolism of nuclear proteins in normal and neoplastic tissues. The relationship of this genetic discussion to cancer is brought out in a chapter on cancer chemotherapy and in a chapter that deals with carcinogenesis.

The second part of the book deals with what Busch calls the phenotype of cancer cells. This designation seems somewhat forced, since no common phenotype in cancer cells is apparent, save perhaps the tendency of most tumors to have high rates of aerobic and anaerobic glycolysis. The discussion of toxohormone, an agent from tumors which suppresses the activity of liver catalase, is very good. A chapter on mucoproteins, better designated as glycoproteins, is interesting but not very pertinent to any "cancer cell phenotype." Cancer antigens, paraproteins associated with plasmacytomas, are also considered.

The author has contributed considerably to knowledge on the interplay of glycolysis and amino acid metabolism and to the utilization of plasma

proteins by neoplastic tissues, and these topics are discussed authoritatively.

This little book should be of considerable interest to all those persons interested in the basic biochemistry of the cancer cell. The coverage is definitely limited, but the treatment is generally good.

R. J. WINZLER

*Department of Biological Chemistry,
College of Medicine,
University of Illinois, Chicago*

A Full Spectrum

Joseph Priestley. Selections from his writings. Ira V. Brown, Ed. Pennsylvania State University Press, University Park, 1962. x + 343 pp. \$5.50.

Joseph Priestley, one of the most prolific writers in a century noted for its prolixity (one need only think of Gibbon), is known today primarily for his discovery of oxygen and a number of other "airs," but his work on gases was only a part of his prodigious activity. To his contemporaries, he was noted as a dissenting preacher whose talent for becoming embroiled in bitter sectarian battles was extraordinary. In his search for the truth, Priestley constantly trampled somewhat tactlessly upon the beliefs of the most influential people of the day and then wondered why they attacked him. It must be said in justice to him that he accepted these attacks calmly and even welcomed them. He had an uncommonly strong belief that the truth would, indeed, prevail and that the duty of the honest pursuer of it was to start as many arguments as possible, for only then would all points of view have a chance to be presented. If one adds to this love of argument a keen mind and a universal curiosity, some of Priestley's literary productivity can be accounted for. The rest followed from the fact that, bursting with ideas as he was, he never took time to rewrite anything. From the theological pamphlet to the history of electricity, everything was composed at white heat and delivered to the printer. Thus it was inevitable that careless errors and contradictions crept into his work, but this fact is compensated for by the feeling, as one reads, that here, literally, is a man at work before you.

From the Priestley collection in the Pattee Library at Pennsylvania State University, Ira V. Brown has selected a representative sample of Priestley's writings. The volume begins with Priestley's autobiography and closes with a moving section on his views of the One True Church. Priestley's scientific work is represented by selections from *The History and Present State of Electricity and Experiments and Observations on Different Kinds of Air*.

Brown has done his editorial work well. The selections represent the full spectrum of Priestley's mind. Each section is introduced by a modest paragraph or two, including basic bibliography, which serves to place what follows in the perspective of Priestley's total achievement.

The book is handsomely produced and may be strongly recommended as an introduction to the mind of one of the most interesting individuals of the 18th century.

L. PEARCE WILLIAMS

*Department of History,
Cornell University*

Polish Translation

Introduction to Set Theory and Topology. Kazimierz Kuratowski. Translated from the revised Polish edition by Leo F. Boron. Pergamon, London, 1961; Addison-Wesley, Reading, Mass., 1962. 283 pp. Illus. \$6.50.

This elegant volume is an English translation of the revised Polish edition of the author's basic textbook on set theory and topology. These two related subjects permeate all of modern mathematics, and training in them is an indispensable part of the education of every mathematician. As an introduction to these subjects, this book is an excellent text for advanced undergraduates or beginning graduate students.

The first eight chapters deal with set theory. The material covers elementary propositional calculus, the algebra of sets, functions, the power of a set, cardinal numbers, ordering relations, and ordinal numbers. The first approach is that of naive set theory, but in due course the axioms of set theory are introduced. The emphasis, however, is on the facts of set theory, not on its foundations. Proofs are given for all but the most sophisticated theorems of set theory.

The fundamental ideas of general and algebraic topology are included in the remaining 14 chapters. With an eye to the important applications of topology to analysis, the author restricts himself to the study of metric spaces, although some of his definitions apply to spaces of greater generality. After defining metric spaces, he discusses limits, convergence, and the properties of closure, open and closed sets, dense sets, and Borel sets. Next come the ideas of continuity and homeomorphism.

Beginning with chapter 13, the treatment is gradually restricted to more specific spaces, such as separable, complete, compact, connected, and locally connected spaces. American readers should note that *compact* means *sequentially compact* and that *bicompact* is used for spaces with a finite covering. Since the author is dealing primarily with metric spaces, however, there should be no confusion. Chapter 19 is a brief introduction to dimension theory.

Algebraic topology appears in chapters 20 and 21, in which the essentials of polyhedral homology are developed. Applications include the Brouwer fixed point theorem and an existence theorem in differential equations. Chapter 22 treats separation properties of the plane, and it includes a detailed proof of the Jordan curve theorem.

Applications to analysis appear in most chapters, and there is an excellent supply of exercises.

CARL B. ALLENDOERFER

*Department of Mathematics,
University of Washington, Seattle*

Nuclear Physics

Rutherford Jubilee International Conference. *Proceedings.* J. B. Birks, Ed. Academic Press, New York, 1961. 856 pp. Illus. \$32.

The Rutherford Jubilee International Conference was held at Victoria University (Manchester, England) from 4 to 8 September 1961 to commemorate Rutherford's 50-year-old discovery of the atomic nucleus and the formulation of the Rutherford scattering law. The 22 invited papers and 197 contributed papers cover topics of current interest in nuclear structure, scattering, dynamical reactions, and radioactive decay. This volume will be of primary interest to nuclear physicists, but several of the