remains even after decalcification. When an iron salt is used to produce calciphylaxis, the Prussian blue-positive iron material disappears from the target area as the calcium enters. Certain challengers act by liberating mast cell granules. These granules contain a substance which attracts calcium, especially in the presence of phosphate and iron. When there is a latent period of calciphylaxis, it apparently depends upon the time necessary to liberate enough calcium from the skeleton for transposition to the challenged sites. It is noted that the critical period is not the time allowed for the development of hypercalcemia but that allowed for the development of the endogenous adjuvants, the state of the mast cell system (whether charged or discharged), the intensity of stress produced by evocative agents, the absorption and excretion of the pathogenic compounds, and the activity of the endocrine system. The resistance to calciphylaxis does not lie in the local process but in the general metabolic changes that attend sensitization and challenge. In this respect there is an important difference between the indirect and direct calcifiers. The theory of calciphylaxis leads to the idea of the existence of a special stromal depot system. In a review of over 1000 articles from the literature on calcifying syndromes, Selye recalls DiMattei's concept of *pharmacothésaurismoses*, the idea that many drugs are stored in the connective tissues of man; this is one way that nature removes poisonous substances from the extracellular fluid and prevents harm to the intracellular chemical system. No measurements were made of serum or tissue calcium, inorganic phosphate, carbonate, citrate, or alkaline phosphatase.

Speculation and Stimulation

This is strictly qualitative work that is unsupported by quantitative data (although the book occupies some 500 pages), a somewhat surprising event in biological science today. The first five chapters (317 pages), are a description of experiments on 50,000 rats. Chapters 6 and 7 (more than 200 pages) deal with clinical implications and speculations. The clinical section is a catalog of disorders associated with soft tissue calcification in man; the farfetched suggestions about treatment, which are included in the section, are sure to detract from the important experimental work. Investigators who repeat Selye's laboratory work will raise this question about the major premise of calciphylaxis: Is it an allergic or hypersensitive state (a manifestation of altered responsiveness dependent upon a sensitizer and a challenging agent) or is it better defined by some other concept? The amount of the hypercalcemic substances, 1.0 milligram of dihydrotachysterol (DHT) and 2.5 grams of albumin, is very large when injected into a 100-gram rat. The book presents no data on the blood volume or serum chemistry to measure the degree of systemic injury and hypercalcemia. It is well known that DHT mobilizes calcium from bone. Some standard experiments must be carried out to support the contention that DHT, apart from its effects on the blood calcium, is a sensitizer.

Large doses of toxic substances may produce anergy, the reverse of calciphylaxis. The old view that metastatic calcification is a chemical reaction to injury (total necrosis being dissolution of the calcifiable structure) is not disproven, and it may even be supported by Seyle's work.

The concept of calciphylaxis, or calcium defense, against a challenging agent is open to question. Why not "calcioffensus," "calciinterment," or "calciinhumatus" of injured or devitalized tissue? In any case, the nature of the local mechanism of calcification is one of the most important unsolved problems of biochemistry. However we choose to interpret Selye's theory, his experiments exhibit a new and startling laboratory phenomenon. This important book is bound to generate a new group of investigators and to stimulate new kinds of experiments on calcium metabolism by workers in all fields of biology and medicine.

Scott's Standard Methods

Standard Methods of Chemical Analysis. vol. 1, *The Elements*. N. Howell Furman, Ed. Van Nostrand, Princeton, N.J., ed. 6, 1962. xix + 1401 pp. Illus. $25.

The value of Scott's *Standard Methods* as a reference source for practical analytical work has been known for half a century. The fifth edition, which appeared in 1939, was the first edited by Howell Furman, who is well known for his contributions to analytical chemistry. The appearance of the sixth edition, which is also edited by Furman, is consequently of considerable interest. Scott's name has been removed from the title page, but many chemists will probably continue to refer to the work by that name.

The objective of *Standard Methods* has been to collect analytical procedures, which are accepted generally as satisfactory and which can be readily applied to certain specified types of samples; this objective has long dictated the organization of the work and the nature of the material included; for example, a minimum amount of background or theoretical material, or critical review of other available methods, has been given. The characteristics of the earlier editions have been maintained in this edition, which will contain three types of chapters: (i) those dealing with a single element, (ii) those dealing with a single "class" of substances, such as plastics or gases, and (iii) those dealing with a single "type" of analytical method, such as microanalysis or ion exchange. While this division makes for certain arbitrariness in the assignment of material, it has apparently served well in the past, and there is reason to believe that, even though this approach may need revision in the future, it will suffice, more or less adequately, for the present.

Volume 1 covers the determination of the elements, chapter by chapter in alphabetical order, with a minimum number of groupings—for example, alkali metals and tantalum and niobium. Volumes 2 and 3, which are scheduled to appear at yearly intervals, will cover classes of material and physical and instrumental methods, respectively.

As an editor, I realize the difficulties of assembling a volume of 53 chapters written by 37 different contributors and of maintaining a comparable level of treatment. Consequently, the large differences in the various chapters, with respect to comprehensiveness of scope and quality and adequacy of treatment, were not unexpected. Some chapters show little indication of any development in the analytical chemistry of the elements concerned during the 20 odd years since publication of the fifth edition; other chapters are complete revisions. Thus, while many chapters fulfill their function as sources of true and tried methods (a characteristic of the Scott set), other chapters are inadequate in that they fail to take account of

changes in the types of samples encountered and in the nature of the analytical information demanded.

In general, I believe that volume 1 fulfills its objective of giving a group of tested procedures that, although they may not be the best methods available, will suffice for many cases in which certain relatively common determinations have to be made. While I would have liked to see more critical discussion of the sources of error in the methods given and of other available methods, these functions are not part of the primary objective of the work.

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Phycology in India

Proceedings of the Symposium on Algology. P. Kachroo, Ed. Indian Council of Agricultural Research, New Delhi, 1960 [1961]. 406 pp. Illus. Paper, $3.

This symposium, which met in New Delhi 7–11 December 1959, was organized jointly by the Indian Council of Agricultural Research and UNESCO's South Asia Science Cooperation Office. The stated purpose was to create interest in algae, especially as a source of food and as a factor in public health problems. That the importance of algae to the rapidly developing Indian civilization has been recognized, but not sufficiently, is clearly shown by the proceedings. Fewer than half of the papers deal with economic aspects, and most of these were given by participants from Europe, Japan, and the United States. The foreign guests were well chosen, all being competent investigators with significant messages to bring to India.

The symposium apparently accomplished its purpose, but the value of publishing the proceedings, other than for prestige, may be questioned. The resulting volume is a mixture of two types of contributions, rather than a group of closely related papers. Primarily, it presents a cross section of phycology in India; secondarily, it presents a partial spectrum of investigations on economic aspects of algae. While the papers by the foreign guests (on such topics as nitrogen fixation and mass culture) cover material that, in large part, has been treated more extensively elsewhere, those by Indian phycologists generally report fresh material and are of sufficiently high caliber to provide some justification for publishing the book, at least from the point of view of someone interested in the overall advance of phycology.

Because of her enormous human resources, India has a high potential for scientific productivity. In an effort to close the gap between actual and potential production, Indian governmental and academic authorities have chosen what appears to be, in my judgment, an unsound plan: the establishment of a series of national journals, covering the spectrum of science. The output of good work in India, now and in the foreseeable future, can easily be accommodated in the well-edited, internationally recognized journals already available. The mere existence of national journals does not increase the amount of good work; rather, it spreads production thin and thus encourages hasty, superficial, and trivial reports. For those, like myself, who have been depressed by this facet of Indian science, the high quality of the present symposium proceedings is reassuring.

The chairman of the organizing committee was M. S. Randhawa, whose lengthy address of welcome does not seem commensurate with his success in convening the symposium. After some entertaining remarks on the esthetic and emotional appeal of algae (an interesting subject rarely broached), Randhawa gives a biased, fragmentary, and often inaccurate history of phycology. Even when one bears in mind that Randhawa's main interest lies in the Zygnemataceae, the choice (and omission) of many items still seems curious. For example, he states, "Lately a good deal of interest has been taken in the U.S.A. in the study of algae. W. J. Hodgetts (1918–25) described conjugation in *Zygogonium ericetorum* and also a number of new species of algae." Hodgetts was British; moreover, there is no mention of such substantial American contributors as G. M. Smith, W. R. Taylor, G. F. Papenfuss, G. W. Prescott, and E. Y. Dawson. The British fare no better. The long list of references, inconsistently cited and riddled with errors, bears little relation to citations in the text. We find Svedelius (1906, 1906–07) in the text, but Svedelius (1939, 1945, 1946) in the bibliography; H. J. Carter (1858) and Nellie Carter (1926, 1932, 1933) are merged into one person; and the purpose of listing 37 references by Randhawa is all too apparent.

The contributed papers underscore the traditional Indian strength in morphology and cytology and their relative weakness in physiology and biochemistry. In the field of ecology new strength is shown. Of several good papers on both marine and freshwater algal ecology, the one by K. S. Srinivasan, "Distributional patterns of marine algae in Indian seas," is especially informative and scholarly. Based on highly dispersed literature as well as on original work, this account is the first picture of the marine algal flora of India as a whole, and it should prove of particular interest to those who plan to participate in the International Indian Ocean Expedition.

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Guideposts to Outer Space

The Stars. A new way to see them. H. A. Rey. Houghton Mifflin, Boston, Mass., ed. 2, 1962. 160 pp. Illus. $6.

Very frequently astronomers are asked to recommend a book that will help someone to learn the constellations. Most persons seem completely baffled by imagined intricacies of the celestial sphere and the way constellations come and go in the sky. This book can be recommended to such persons as a great aid to learning about the constellations.

What is meant by "knowing" a constellation may be a matter of debate. Most of us recognize them as geometrical patterns that bear no relation to their names. But the author, H. A. Rey, thinks that the star patterns should appear as the name of the constellation suggests, and because he has taken great pains to connect the stars in each constellation into appropriate figures, in this book Leo looks like a lion! This should make the identification much more appealing to the new generations just beginning to learn about the sky.

The author starts with a few simple ideas necessary for finding one's way among the stars, and he wisely leaves the complications until late in the book. The reader can learn to identify constellations without worrying about such terms as *declination* or *hour circle*. Only in the last part of the book does the author give what he calls the "hows