37 diverse subject fields represented, only the following were so frequent as to comprise at least 10 percent of a journal's contents: zoology, 24 journals; botany, 15; chemistry, geology, 9; agriculture, 7; education, 5; forestry, physics, 4; biochemistry, mathematics, psychology, 3; conservation, medicine, geography, history, 2; nutrition, physiology, biology, language and literature, 1. That these frequencies do not correspond very closely with the fields of most interest of academy members as recorded by Bevan (*9*) is apparently due to the inherent qualities of each discipline (for example, its adaptability to local interpretation, the need for elaborate equipment to pursue the science, its appeal to amateurs) or to other factors. Thus it appears that many academy journals still serve to a large extent as vehicles for the publication of papers in zoology and botany at the expense of the other sciences, as was early recognized by Bayley (*5*).

Whether or not academy papers are, in effect, buried in libraries and in the literature of science depends upon the comprehensiveness of the abstracting or indexing in a particular subject field. Table 1 lists major bibliographies and indexes that include academy journals in their lists of periodicals received and gives the number of academy publications processed by each. Of course, these lists may vary from year to year and for each service depending upon its editorial policies and facilities and upon the availability of the journals analyzed and the suitability of the articles included in them. These points should be considered by the academy member who desires to have a paper printed in his state academy journal, if he is at all concerned with its ultimate audience.

While there are some academies with excellent scientific journals, it might be suggested that in other cases (for example, where an academy publication is in a comatose or moribund condition, or in academies where members need to be cajoled into submitting papers) the committee in charge of publications should reevaluate its journal in terms of what it could be doing to satisfy the objectives of a *modern* state academy of science. Upon comparing their journal with other scientific periodicals, they might well decide that the time had arrived to heed Cattell's remarks, and that an improved newsletter or a more efficient means of publication (*10*) would serve a better purpose than a poorly indexed journal spread thin over an encyclopedic range of subjects.

Table 1. Number of state academy publications analyzed by abstracting and indexing services (maximum number for 1–5-yr period).

Number	Analyzing service
28	*Bibliography of Agriculture*
25	*Chemical Abstracts*
25	*Annoted Bibliography of North American Geology*
23	*Biological Abstracts*
9	*Annoted Bibliography of Economic Geology*
8	*Chemisches Zentralblatt*
7	*Psychological Abstracts*
7	*Bibliographic Index*
6	*Mathematical Reviews*
3	*Index Medicus*
2	*Physics Abstracts*
2	*Engineering Index*

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References and Notes

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4. P. P. Boyd, *ibid.* **51**, 575 (1920).
5. W. S. Bayley, *ibid.* **57**, 623 (1923).
6. W. Segerblom, *ibid.* **66**, 571 (1927).
7. G. E. Johnson, *ibid.* **76**, 373 (1932).
8. C. A. Browne, *ibid.* **84**, 1 (1936).
9. A. Bevan, *Sci. Monthly* **73**, 257 (1951).
10. See C. F. S. Sharpe, *Science* **92**, 403 (1940).

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Book Reviews

Protozoology. Richard R. Kudo. Thomas, Springfield, Ill., ed. 4, 1954. xi + 966 pp. Illus. $10.75.

The fourth edition of this basic textbook was developed to keep pace with currently expanding research activity involving the Protozoa. In the span of 25 years since the appearance of the first edition, this work has become the standard American reference handbook on protozoan systematics and morphology. As an outgrowth of the author's long career as a teacher, the book has been directed toward college and graduate students who desire an introduction to protozoology.

Each edition has been marked by an expanding treatment of general biological topics (for example, sexuality, heredity, ecology, nutrition, general physiology), culminating now in an imposing book of 966 pages (778 pages in the 1946 edition, 451 pages in the first edition). The 376 text figures are of uniformly fine quality and include four colored plates and several halftones. Usefulness of the text is heightened by inclusion of separate author and subject indexes, along with an enlarged bibliography at the end of each chapter that thoughtfully includes the titles of all papers cited.

The basic organization of the book is unchanged. The first section (246 pp.) treats general aspects of protozoan organization, ranging through comparative morphology, ecology, physiology, reproduction,

and heredity. This is followed by a larger section (631 pp.), containing an intensive survey of the individual taxonomic groups. In each case this survey begins with a characterization of the group and extends through definitions of representative species of each genus; a running taxonomic key is helpful in separating forms within each group. Special effort has been devoted to insure adequacy of treatment of parasites without restriction to those of concern to medical parasitology. A terminal chapter (25 pp.) presents a compact, useful outline of methods of collecting, cultivating, and staining protozoans.

Each student will have his own opinion of the adequacy of particular portions of the text. Some may be disturbed by the failure to modify the taxonomic system itself in light of recent, well-documented proposals by Fauré-Fremiet for the entire ciliate assemblage and by Kirby for the morass of animal flagellates. Others may regret the failure to include Lowndes' fundamental analysis of flagellate locomotor mechanisms and, on a still more physiological plane, may decry the absence of a clearer exposition of our present knowledge of protozoan nutritional patterns. In a few places minor errors have crept in, such as the failure to distinguish between the blepharoplast and kinetoplast of hemoflagellates.

The fact remains, however, that the present edition incorporates solid improvements and still further strengthens the outstanding value of this textbook as an introduction to the structural organization of the Protozoa.

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The Pineal Gland. A review of the physiologic literature. Julian I. Kitay and Mark D. Altschule. Published for the Commonwealth Fund by Harvard Univ. Press, Cambridge, Mass., 1954. xiv + 280 pp. Plates. $5.

In many quarters, particularly in America, the function of the pineal body is generally assumed to be unknown. For example, in Maximow and Bloom's widely used *Textbook of Histology* (Saunders, 1952, ed. 6), the question is summarized as follows.

> Unfortunately, extirpation and injection of extracts of the organ have given inconstant and highly contradictory results. Typical secretory granules are not found in specific pineal cells.

In their book Kitay and Altschule subject this belief to a critical examination by analyzing statistically the widely scattered physiological literature on pinealectomy, pineal-extract administration, and pineal implantation in various animals (mainly frogs, chicks, rabbits, mice, and rats). As a further means of appraising the question of pineal function, they reexamine the clinical evidence that indicates a possible correlation between pineal tumors and changes in the genital system of boys.

Analysis of the experimental data, the most reliable and best controlled of which have appeared in recent years, supports the conclusion that pinealectomy affects the genital systems, causing gonadal hypertropy, acceleration of vaginal opening in immature rodents, and prolongation of estrus with shortening of diestrus in mature rodents. Contrariwise, pineal-extract administration produces gonadal atrophy, retards vaginal opening, and inhibits the action of pituitary gonadotropin. Pineal extracts are also said

> . . . to inhibit changes in blood chemistry that are consistent with the action of corticotrophin and the adrenocortical hormones; they also decrease 17-ketosteroid excretion.

The evidence of correlations between the pineal body and other endocrine glands is said to be inconclusive, as are also effects of the pineal on body growth and development. Pineal-extract administration is reported to cause statistically significant elevations in blood glutathione in psychotic patients as well as a marked decrease in hyperketonuria caused by stress of surgical operation. Unfortunately, the authors do not inquire or attempt to establish whether these "statistically significant" effects of the administration of "extracts" are *biologically significant* or *specific in character.*

Since the inquiry is confined to a statistical analysis of selected physiological data, no mention is made of possible physiological implications of the observed age involution of the human pineal gland or of the fact that in some vertebrates, including several groups of mammals, the pineal body is rudimentary. Nor are the neural connections of the brain and pineal body considered with respect to the changes following pinealectomy.

The second part, entitled "Clinical correlations," concerns a syndrome of precocious puberty seen in boys. This was first described half a century ago by Marburg, who ascribed it to decreased secretion of the pineal gland, associated with pineal tumors. The present authors claim that this syndrome is associated strictly with pineal tumors composed of nonparenchymal cells, whereas tumors consisting of parenchymal cells are not accompanied by any genital disorder. They attribute the induction of the genital syndrome to the suppression or replacement of the specific parenchymal cells by nonparenchymal (neuroglial) elements with an associated decrease in the inhibition that the pineal body normally exerts in some manner on the male gonads. Although Kitay and Altschule offer no explanation for the failure of such tumors to induce sexual precocity in girls, they regard the clinical findings as consistent with the results obtained experimentally in animals. In view of the importance of the issue of two different kinds of tumors, it is to be regretted that typical histopathological illustrations of them are not included. Such pictures might well have replaced the book's frontispiece, which is a poorly defined, colored reproduction of a histological section (bearing the caption "Pineal gland [presum-