SCIENTIFIC BOOKS

MILLER'S COLLECTED WORKS

WITH the publication by the University of Illinois Press of the second volume of the Collected Works of George Abram Miller this set begins to take on the appearance of an imposing monument to a long and well-spent life. The large body of mathematicians who are interested in the advancement of group theory realize with gratitude the great convenience to them of this collection of so many scattered papers, long and short, into a readily accessible form.

The papers of Volume II date mostly from the years Miller spent in California. He was then much interested in groups generated by operators with given relations between them, in groups of isomorphisms, in extensions of Sylow's theorem and in groups of prime power order. Of the many topics discussed in this volume, probably the most important is that of the groups of order p^m which contain cyclic subgroups of order p^{m-2}. This is well covered by three papers, on pages 89, 165 and 271. Certainly the most brilliant results are to be found in the paper, written in collaboration with H. C. Moreno, on non-Abelian groups in which every proper subgroup is Abelian. The most extensively studied and the most baffling problem of finite group theory is that of the existence of simple groups of odd composite order. In one of these papers (see page 83) Miller showed that if such a group does exist there must be more than 50 members in any complete set of conjugate operators or subgroups. The statement on page 13 that Turkin has announced the solution of the problem seems to be a mistake.

What with book reviews, short expository articles, reports on the progress of group theory prepared for the American Mathematical Society and historical essays at the beginning and end of this volume, it, like the first, has much to interest the general reader.

STANFORD UNIVERSITY W. A. MANNING

A GUIDE IN ENTOMOLOGY

A Laboratory Guide in Entomology. By ROBERT MATHESON. vii + 135 pp. 48 plates. Ithaca, N. Y.: Comstock Publishing Company. $2.00. 1939.

FOR many years there has been need for a satisfactory laboratory manual for the study of insects. Consequently, those entomologists and zoologists who are called upon to teach beginning courses in entomology will welcome Matheson's new laboratory guide. The manual seems to be well done, and, in as much as it presents a general view, it should be serviceable in giving a fundamental knowledge of insects to those who will branch out into other fields of biology as well as furnishing preparation for advanced studies in entomology.

The manual is based on the work offered in the beginning course in entomology at Cornell University. It begins with a brief study of a crayfish to refresh students' minds as to the fundamental structure of the arthropods. The essentials of insect anatomy, both external and internal, are gained from a thorough study of a grasshopper. This is followed by a comparative study of mouth-parts; metamorphosis and growth; structure and classification of principal orders, with keys for identification of families; and some work on adaptation, social life, insect pollinators, relation of insects to animal and plant diseases and insect control. Of practical value is the appendix on how to collect, prepare, mount, preserve and rear insects. Brief lists of references are given in connection with some of the exercises. There are forty-eight well-executed plates, most of which are for the student to interpret and label. The pages are perforated and punched so that the plates may be removed and inserted in a loose-leaf notebook. A glossary of technical terms used in the manual is included.

I. E. GRAY

SOCIETIES AND MEETINGS

INDIANA ACADEMY OF SCIENCE

THE fifty-fifth annual meeting of the Indiana Academy of Science was held on November 9, 10 and 11, in Terre Haute, Ind., with Indiana State Teachers College as host. Some 350 scientists from Indiana and adjoining states were in attendance. The general meetings were presided over by Dr. L. A. Test, vice-president, Purdue University, in the absence of the president, Dr. T. G. Yuncker, DePauw University, who is on a botanical research expedition in the South Seas. Dr. Willis S. Blatchley, one of the charter members of the academy and now eighty years of age, gave the principal address on "The Days of a Naturalist."

Some eighty-six research papers were read at the nine divisional meetings, and a panel discussion on "Teaching Bacteriology" was also carried out in the Bacteriology Division. The following divisional chairmen were chosen for 1940: archeology, Paul Weer, Indianapolis; bacteriology, Dona G. Graam, Indiana State Teachers College; botany, Ralph M. Kriebel, Soil Conservation Service, Bedford; chemistry, Karl Means, Butler University; geography and geology, W. D. Thornbury, Indiana University; mathematics, Cora B. Hennel, Indiana University; physics, James F. Mackell, Indiana State Teachers College; psychology, R. A. Acher, Indiana State Teachers College; zoology, W. H. Hiestand, Purdue University.

The dinner meeting was held on Friday evening with 150 in attendance, after which President

Yuncker's address on "Parasitism as a Way of Life" was read by Dr. Winona Welch, DePauw University.

The officers chosen for the year 1940 are: *President,* Frank Wallace, state entomologist, Indianapolis; *Vice-president,* S. S. Visher, Indiana University; *Secretary,* W. P. Allyn, Indiana State Teachers College; *Treasurer,* W. P. Morgan, Indiana Central College; *Editor of the Proceedings,* Paul Weatherwax, Indiana University; *Press Secretary,* Will E. Edington, DePauw University.

The Junior Academy of Science held its meetings on Saturday with an attendance of 200. A number of papers were read by the young scientists, and the various high-school clubs had very interesting exhibits on display. The principal address was given by Dr. W. P. Allyn, Indiana State Teachers College, on "Indiana Fauna." Miss Ruth Downey, George Washington High School, Indianapolis, and Robert Bennett, Mishawaka High School, were chosen as the two outstanding junior scientists and were recommended for the honorary memberships in the American Association for the Advancement of Science. The officers of the Junior Academy for 1940 are: *President,* Jack Wilkie, Elmhurst High School, Fort Wayne; *Vice-president,* Dorothy Smitha, George Washington High School, Indianapolis; *Secretary-Treasurer,* Robert Karler, Mishawaka High School.

The state societies of taxonomists and entomologists, which are affiliated with the academy, held their meetings on Saturday.

The annual meeting of the academy for 1940 will be held in Muncie, Ind., with Ball State Teachers College as the host institution.

WILL E. EDINGTON,
Press Secretary

THE NEW ENGLAND INTERCOLLEGIATE FIELD GEOLOGISTS CONFERENCE

THE thirty-fifth annual conference of the New England Field Geologists was held in Hartford, Conn., on October 20, 21 and 22. Dr. Edward L. Troxell, of Trinity College, was in charge of local arrangements, and was assisted by geologists from Wesleyan and Yale Universities. More than 150 geologists attended the field trips and the discussion meetings at the College Lounge. Dr. Remsen Ogilby, president of Trinity College, welcomed the visitors.

The Friday afternoon field trip was led by Dr. Troxell. This trip included the relations between the lava flows and Triassic sandstones on the Trinity Campus, the pillow structure and mineral content of the flows near New Britain, and a spatter cone in a trap rock quarry near Farmington.

Dr. Chester R. Longwell, of Yale University, conducted a trip on Saturday to the eastern border of the Triassic Lowland. The geologists studied the evidence of the great eastern boundary fault, as recorded in sediments and structure of Triassic strata, in features of Triassic igneous rocks and in structure of pre-Triassic rocks. The distribution of fan-glomerate and increase of grain size away from the fault were emphasized.

The glacial geology of the Hartford-Middletown region was studied under the direction of Dr. Richard F. Flint, of Yale University. The features of the dissected clay plain, red gravel knolls, continuous knolls of "kame" type, ice-contacts, varved silt and clay, kettle complex in kame terraces and parallel-bedded dunes were discussed.

Dr. Joe Webb Peoples and Dr. Dave Keppel, of Wesleyan University, conducted an excursion on Sunday to show the lithology and structures of some of the crystalline rocks bordering the Triassic on the east between East Hartford and Portland. Parallelism between the structural lines of the crystalline Glastonbury gneiss, Bolton schist, Maromas gneiss and pegmatites with the Triassic was illustrated at numerous places. The trip was concluded at the Strickland quarry.

An excursion for glacial geologists was made to the Quinnipiac-Farmington lowland on Sunday under the leadership of Dr. Richard J. Lougee, of Colby College. A glacial delta with an attached esker was studied.

It was voted at the annual business meeting to meet at Dartmouth College, Hanover, N. H., in 1940, under the leadership of Dr. J. W. Goldthwait.

LLOYD W. FISHER,
Permanent Secretary

BATES COLLEGE

SPECIAL ARTICLES

THE MECHANISM OF THE BIOLOGICAL CITRIC ACID SYNTHESIS

THE role of pyruvic acid in the synthesis of citric acid in the animal organism has been studied earlier by Simola,[1] who found that administration of pyruvic acid to rats induces a comparatively powerful excretion of citric acid, and also by Simola and Alapeuso,[2] who demonstrated a synthesis of citric acid *in vitro* by adding pyruvic acid to finely ground tissue pulp. Continued research by Simola, Hallman and Alapeuso[3] showed that, under definite experimental conditions, addition of pyruvic acid together with fumaric or oxalacetic acid to the tissue pulp produced effects which were more pronounced than those caused by any

[1] P. E. Simola, *Skand. Arch. f. Physiol.,* 80: 375, 1938.

[2] P. E. Simola and H. Alapeuso, *Suomen Kemistilehti* (*Acta chemica fennica*) B, 11: 17, 1939.

[3] P. E. Simola, N. Hallman and H. Alapeuso, *Suomen Kemistilehti* (*Acta chemica fennica*) B, 12: 10, 1939.