plement but not to greatly duplicate the more biochemical treatments which are available in other monographs.

It is frankly a text-book for the advanced student, for one who already has a strong background of descriptive organic chemistry, and is designed for instruction at the graduate level. As such a text it merits and will unquestionably receive wide adoption. In many instances the material in a single chapter is nowhere else available in monograph form, so that from the standpoint of time-saving alone the student of theoretical organic chemistry should be enormously assisted by possessing these volumes. Furthermore the text gives every evidence of a careful sifting of the literature by one who has himself worked in that special field so that much of the dross has been sifted out in the process of compilation.

Volume I deals with organic theory and includes a consideration of Alicyclic Compounds and the Theory of Strain; Theory of the Structure and Reactions of Aromatic Compounds; Stereoisomerism; Organometallic Compounds; Free Radicals; Unsaturation and Conjugation; Open-Chain Nitrogen Compounds; Molecular Rearrangements; and Comparison of Chemical Reactivity.

Volume II contains four chapters closely allied to those in Volume I, *i.e.*, Modern Electronic Concepts of Valence; Constitution and Physical Properties of Organic Compounds; Rotatory Dispersion; and The Significance of Resonance to the Nature of the Chemical Bond and the Structure of Molecules, and in addition nine chapters dealing with natural products, Natural Amino Acids; The Chemistry of Pyrimidines, Purines, and Nucleic Acids; Alkaloids; The Anthocyanins and the Flavones; Carotenoids: The Polyene Pigments of Plants and Animals; The Sterols, Bile Acids, and Related Compounds; and Chapters 16, 17, and 18 on the carbohydrates. As already noted, the approach of all of these natural-product chapters is that of the organic chemist, although there is considerable biochemistry and some biology interwoven into certain of the discussions.

The editorial board is to be congratulated on the high standard of excellence maintained for the individual chapters. The volumes are highly recommended for adoption as an advanced text. They should be on the study desk of every teacher of organic chemistry and of every advanced student of chemistry. Even those whose interest lies wholly in physical chemistry will find here much that will interest them.

ROSS AIKEN GORTNER
UNIVERSITY OF MINNESOTA

THE ORIGIN OF LIFE

The Origin of Life. By A. I. OPARIN. Translated by Sergius Morgulis. Macmillan, 1938.

IN this book a biochemist brings chemical evidence to bear on the subject of the origin of life. It is, of course, impossible for him to prove his theory; but taking into consideration several organic and physico-chemical facts, a well-knit story is told.

Without going into details, Professor Oparin is against any theory which is based on some "sudden" generation of life; nor is he more favorably disposed towards Schafer's conception that life-giving, organic substances are constantly being evolved from inorganic material. Nor, indeed, does the author feel that there is any absolute difference between the "lifeless" and the "living." He discards completely the conception of a "vital energy." At some dim and distant period in the history of the world, when a gaseous mass separated from the sun and became the earth, certain "matter" began gradually to evolve until a simple primary organism was formed. During such untold years carbides were transformed to hydrocarbons, the latter gave rise to alcohols, aldehydes and organic acids, and, in the presence of ammonia, to amides, and, in the presence of water, high molecular organic compounds, including proteins, appeared.

Colloids representing complex organic molecules were first uniformly distributed in solution; these then separated into "semi-liquid, colloidal gels" with an all-important spatial arrangement within their molecules. The colloids grew; and such "colloidal systems with a highly developed physico-chemical system" gave rise to the simplest primary organisms.

The book has to be read to follow the many lines of argument. It is a stimulating product. Neither can one overlook the translater of the text, who has done an excellent job in a difficult field.

BENJAMIN HARROW
CITY COLLEGE,
COLLEGE OF THE
CITY OF NEW YORK

SOCIETIES AND MEETINGS

THE ILLINOIS STATE ACADEMY OF SCIENCE

THE thirty-first meeting of the Illinois State Academy of Science was held at Southern Illinois State Normal University, Carbondale, on May 6 and 7. At the general session on Tuesday morning, President Roscoe Pulliam, of the Southern Illinois State Normal University, gave a short address of welcome. The members of the academy then listened to the address of the retiring president, Professor Harold R. Wanless, of the University of Illinois, who talked on the subject, "Geological Records of a Rhythmic Nature."

His talk was followed by an address by Dr. M. M. Leighton, chief of the Illinois State Geological Survey, Urbana, whose subject was "Our Exhaustible Resources of Minerals. What Should be the Aim of a Conservation Program?" The final address of this session was given by Dr. Theodore H. Frison, chief of the Illinois State Natural History Survey, on the subject, "Advances in the Renewable Natural Resources Program of Illinois." The Friday morning program of the Junior Academy consisted of the display and the judging of the exhibits by the junior members entered in the annual competition. At the Friday evening general meeting, Dr. T. E. Musselman, of Quincy, addressed the Junior Academy on the topic, "Birds That Hunt and are Hunted," while Dr. John A. Wilson, director of the Oriental Institute of the University of Chicago, Chicago, gave the evening address before the Senior Academy on the subject, "New Spades in Old Soil."

On Friday afternoon 121 papers were presented before eleven sectional meetings. On Saturday the sessions of the meeting consisted of three field trips in the region of Carbondale. The anthropological trip under the direction of Dr. Bruce Merwin and Mr. Irvin Peithman, both of Carbondale, visited some of the many archeological sites of the region. The geological trip, under the direction of Dr. George E. Ekblaw and Mr. J. E. Lamar, of the Illinois State Geological Survey, and Professor H. R. Wanless, of the University of Illinois, visited points of geological interest. The biological trip, which visited the National Forest, Horseshoe Lake and other points of biological interest, was under the direction of Dr. T. H. Frison, chief of the Illinois State Natural History Survey, with the assistance of the other members of his staff, members of the National Forest Service and Mr. Francis D. Hunt, of the State Department of Conservation.

The following resolutions were passed by the academy at its business meeting:

(1) *Resolved,* that the Illinois Academy of Science heartily approves the efforts of the Associated Conservation organizations of Illinois to further the commission plan for the administration of the Department of Conservation in Illinois, and that a copy of this resolution be sent to Don T. Mason, Secretary of the Associated Conservation Organizations of Illinois.

(2) WHEREAS: From time to time medical progress is hampered by misleading campaigns for legislation by Anti-Vivisection Societies and whereas the prohibition of humane animal experimentation throttles scientific research into the nature and treatment of diseases common to both animals and man, the Illinois Academy of Science hereby resolves that such activity is ill informed and dangerous to the public well being.

(3) The Illinois Academy of Science desires to record its protest against the introduction into Primeval National Parks of any form of commercialism. Embracing only a minute part of our national area, these superb and irreplaceable examples of unique, primitive conditions should be kept inviolate and preserved for the education and inspiration of future generations. The Illinois Academy urgently petitions all state and federal officers, and especially, the President of the United States, and members of his cabinet, as well as members of Congress, to oppose resolutely the granting of permits extending such privileges in these parks. It is hereby ordered that a copy of these resolutions be sent to the President. Also to the members of the Cabinet, to Illinois Senators, and Representatives in Congress, and that they be furnished to all societies and persons interested in the National Parks.

(4) WHEREAS: It is necessary for the conservation of archeological and historical sites in Illinois that a law be enacted by the General Assembly providing for the licensing of all persons or institutions who desire to excavate prehistoric sites, ancient burial grounds, or any site of importance to the history of Illinois; *be it resolved* that the Committee for Conservation of Archaeological and Historical Sites be empowered to confer with the Director of Registration and Education, and to draw up a bill for submission to the council of the Academy for its approval.

(5) *Resolved,* that the Academy reaffirms its past position with respect to emphasizing the importance of the research agencies of the State, and that they continue their sound and thoroughgoing researches on the natural resources of the State with a view to more intelligent development and conservation.

The officers elected for next year are:

President, George D. Fuller, botany, University of Chicago.

First Vice-president, Evelyn I. Fernald, botany, Rockford College.

Secretary, Robert F. Paton, physics, University of Illinois.

Treasurer, Paul D. Voth, botany, University of Chicago.

The next annual meeting will be held in Springfield, Ill., on May 5 and 6, 1939.

ROBERT F. PATON,
Secretary

THE NORTH CAROLINA ACADEMY OF SCIENCE

THE thirty-seventh annual meeting of the North Carolina Academy of Science was held at the North Carolina State College of Agriculture and Engineering of the University of North Carolina, Raleigh, N. C., on May 6 and 7, 1938. The meeting was exceptionally well attended by members and visitors. Ninety papers and several exhibits made up a record program.

Because of the large number of titles, especially in the field of botany, it was necessary to create two new sections, one for botany and one for zoology.

The General Section met at 9:30 A.M. on the first