more than the bare facts about Ramanujan's work. Some of it, however, is due to the fact that since 1936 much new work has been done on certain of his problems. Lectures VIII and X on the asymptotic theory of partitions and on Ramanujan's function $\tau(n)$ contain a great deal of recent mathematics. The connections between Ramanujan's work and that of other writers, especially those who came after him, are traced in each lecture with many interesting comments. Each lecture closes with a set of valuable notes, and there is a bibliography of over 100 papers on problems suggested by Ramanujan.

Ramanujan surpassed all other men in his ability to produce striking formulas. Opening the book at almost any place one is sure to find some arresting equality, something typographically complicated with bizarre exponents and coefficients. In this respect Ramanujan differed from the typical modern mathematician who is trying to find the simplest possible relationships between extremely general concepts. The actual source of one of these startling formulas is often mysterious, and the author frequently indulges in interesting speculations. It is true that Ramanujan discovered a number of interesting results experimentally, but his experiments were never on a large scale. Many of the formulas which he gave as approximately correct are not as accurate as he had surmised, as a little experimenting would have shown. Perhaps his most interesting use of the experimental method occurs in connection with the study of his function $\tau(n)$, defined as the coefficient of x^{n-1} in the expansion of the 24th power of $(1-x)(1-x^2)(1-x^3)\ldots$. After examining the first 5,000 of these coefficients $\tau(n)$ and finding only one divisible by 691 he had the courage to conjecture that $\tau(n)$ is divisible by 691 for *almost all n*, a conjecture which later proved to be true.

The reader who is unable to appreciate Ramanujan's fields of endeavor, but who is interested in what constitutes and causes mathematical genius will find the book absorbing. There are several interesting passages on the subject of "proof" and what it meant to Ramanujan. The book is written in the best Hardy style.

D. H. LEHMER

UNIVERSITY OF CALIFORNIA

SOCIETIES AND MEETINGS

THE ILLINOIS STATE ACADEMY OF SCIENCE

THE thirty-fourth annual meeting of the Illinois State Academy of Science was held at Northwestern University, Evanston, Illinois, on May 1, 2 and 3. Cooperating as hosts to the State Academy were the museums and other interested organizations in the Chicago area. Over 500 registered for the meeting and 150 lectures, scientific papers and reports were given.

Some of the high-lights of the meeting were the addresses at the general session on Friday morning, the lecture given to both the Senior and Junior Academy members on Friday evening, and the tours of the museums on Saturday morning. Dr. V. O. Graham, the retiring president, gave an illustrated lecture Friday morning on "Fungi and Man." This was followed by a description and records showing "Patterns in Negro Music" by Dr. M. J. Herskovits. "Wood Duck Studies in Illinois" by Dr. T. H. Frison completed the Friday morning program.

The afternoon was devoted to section meetings. There were twelve of these, Botany, Physics and Zoology holding double sessions. The symposium on "Animal Geography in Illinois" and one on "Endocrinology" planned by Dr. W. V. Balduf, chairman of the Zoology section, were particularly well received. The Association of Physics Teachers of Illinois, an affiliated society, sponsored the Physics program, and Dr. P. A. Constantinides, the chairman, arranged two interesting sessions, the main theme being applied physics. Almost all the sections were well attended and the academy is pleased to announce the formation of a new section for Illinois in Social Science. All those interested in this group are urged to get in touch with the chairman for 1941–42, Dr. John Kinneman, of Normal, Illinois.

At the banquet in the evening the American Association for the Advancement of Science awards were announced, grants in aid being made to C. L. Furrow, of Knox College, Galesburg, Illinois; C. C. Hoff, of the University of Illinois, Urbana, Illinois; J. F. Stanfield, of Chicago Teachers College, Chicago, Illinois; and P. H. Kinsel, of Edwardsville High School, Edwardsville, Illinois. While these grants can not be large, they have always served to stimulate research interest.

The evening program consisted of an illustrated address and colored moving pictures given by Dr. Ralph Buchsbaum on "A Summer in a Tropical Rain Forest of Barro Colorado Island, Panama." A group of nearly a thousand Junior and Senior Academy members attended this lecture. After the lecture the awards given by the Junior and Senior Academy to winners in the Junior Academy exhibits were presented. Altogether over 300 certificates were awarded, as well as cups for unusually worth-while work in the various sciences. The American Association for the Advancement of Science Junior Academy awards went

to Mary Cathrine Rowley, Canton, Illinois, and Bill Hahn, Rockford, Illinois. These awards were especially well received and help to maintain interest in the Junior Academy group. No one could have attended this meeting without realizing that the oncoming generation of scientists will be an active and able one.

On Saturday morning so many private cars were available that only two bus loads of academy members went on the museum trips. So many possibilities were offered that the number in attendance at any one meeting was small, but many reports of interesting and worth-while experiences were heard.

At the council meeting it was voted to accept the invitation of the University of Illinois to hold the annual meeting of 1942 in Urbana. This is in line with the policy of the academy to hold its meetings in various parts of the state. The section chairmen in charge of the several groups in the academy are:

Agriculture—C. H. Oathout, Macomb, Illinois.
Anthropology—D. E. Wray, Peoria, Illinois.
Botany—J. F. Stanfield, Chicago Teachers College, Chicago, Ill.
Chemistry—N. D. Cheronis, 5556 Ardmore Avenue, Chicago, Illinois.
Geography—J. E. Van Riper, Carbondale, Illinois.
Geology—A. H. Sutton, Urbana, Illinois.
Physics—F. L. Verwiebe, Charleston, Illinois.
Psychology and Education—J. M. Hughes, Northwestern University, Evanston, Illinois.
Social Science—John Kinneman, Normal, Illinois.
Zoology—O. Parks, Northwestern University, Evanston, Illinois.

The section chairman of the academy has always been the nucleus about which the Illinois Academy functions. A great deal of appreciation has been voiced for the work of the retiring chairmen and the officials at Northwestern who cooperated so effectively. Plans for the 1942 meeting at the University of Illinois are already being formed. Local officers to whom inquiries concerning the activities of the academy and in particular, questions on plans for the 1942 meeting, may be addressed are: *President,* Dr. T. H. Frison, Natural Resources Building, Urbana, Illinois; *General Chairman,* Dr. G. E. Ekblaw, Natural Resources Building, Urbana, Illinois; *Secretary,* Dr. R. F. Paton, Department of Physics, University of Illinois, Urbana, Illinois.

The chairman of the Junior Academy, Mrs. Mary Creager, Vienna, Illinois, has immediate charge of the Junior Science activities. It seesm likely now that facilities will be available at the University of Urbana to hold a more effective exhibit of science work in the secondary schools than is usually the case. Buildings will probably be available to permit setting up these exhibits for several days. Many high schools are already cooperating in this program and the activities of the science clubs in the high schools of the state are being recognized as an important tool of the educator.

Illinois wishes to announce also that active plans are underway to promote scientific meetings among interested student groups of college level. This movement is attracting much favorable attention among several of the state academies.

R. F. PATON,
Secretary

SPECIAL ARTICLES

THE EFFECT OF 2, 3, 5, TRIIODOBENZOATE ON THE GROWTH OF TUBERCLE BACILLI

IT has been shown that the addition of salicylate to a washed suspension of tubercle bacilli of the B_1 and H37 strains increases their oxygen uptake.[1] Certain other substances have similar effects and an attempt was made to find a compound which would inhibit the extra oxygen uptake. 2, 3, 5, triiodobenzoate was found to cause a marked inhibition (Fig. 1). The effect on growth of this and similar compounds was then tried.

Both the B_1 and H37 strains were used and gave similar results. The culture medium was a veal glycerine infusion broth adjusted to pH 6.7. The cultures were incubated at 37° C. The area of growth was measured daily and the average of five bottles was used for each point. When the areas showed definite differences the bottles were autoclaved and the bacteria filtered, dried and weighed. The differences found by area and weight usually checked within 10 per cent. The triiodobenzoate obtained from Eastman Kodak Company was recrystallized from glacial acetic acid and neutralized to pH 6.7. Fig. 2 shows that in very small concentrations it inhibits growth. If a culture which has not grown in the presence of triiodobenzoate is transferred to fresh medium, growth will occur showing that the cells have not been killed. If the drug is added during the rapid growth phase inhibition also occurs.

The importance of substitution in the ortho position of the benzoic acid is shown by the fact that 3, 5, diiodo-2-hydroxybenzoate is as effective as triiodobenzoate in inhibiting growth, whereas 3, 5, diiodo-4-hydroxybenzoate requires a much higher concentration. Salicylate itself, although it increases oxygen uptake,

[1] F. Bernheim, SCIENCE, 92: 204, 1940; *Jour. Bact.* (in press).