the Central States. At the present time it has been reported to be permanently established only at Ames, Iowa.[1]

Up to the present, the only record of this flea in Ohio is based on several specimens collected in Youngstown, reported by Ewing and Fox (1938).[2] Apparently no other infestation has been reported in the state.

In the winter and spring of 1940, several hundred specimens were collected from a feed box in the basement of the Botany and Zoology building at the Ohio State University. The fleas were apparently coming in with the feed, which was procured from the University Farm, located across the river from the campus.

In the fall of 1940, an examination was made of 25 rats which were caught in the residential section of Columbus in the vicinity of the university campus. Fifty-one specimens of *Xenopsylla cheopis* were recovered from 18 rats, varying from one to six per rat. No other species of fleas were encountered. This information would seem to indicate that the oriental rat flea is probably established in Columbus.

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# SCIENTIFIC BOOKS

## MATHEMATICAL ANALYSIS

*A Course of Analysis.* By E. G. PHILLIPS. viii + 361 pp. Cambridge: the University Press. 1939. $4.00.

THIS text is an introduction to mathematical analysis based on the author's lectures to honors students in mathematics at the University College of North Wales. The reader is assumed to possess a working knowledge of the calculus, and the present treatment provides precise arithmetic definitions of most of the basic concepts, and a rigorous justification for many of the processes of the differential and integral calculus as applied to the functions of one or more real variables.

Of the included topics, besides those to be expected from their appearance in elementary calculus, the following deserve special mention. The discussion of the number system is preceded by a brief outline of Russell's definition of number based on logical notions. A well-written chapter on inequalities includes that of Jensen, as well as those of Hölder and Minkowski and a proof which illustrates the notion of "a best possible constant." Functions of bounded variation are discussed in connection with the rectifiability of plane curves.

Complex numbers are defined, and the possibility of extending a few results to them is mentioned. However, the author makes no attempt at any systematic treatment of complex values, not even defining $\sin z$. The limitation to real values seriously handicaps him in the treatment of Taylor's series and necessitates the omission of the justification for several expansions in Taylor's series which occur in the examples.

Definitions of the elementary functions for real values are given. That of $\log x$ and $e^x$ in Chapter X is based on integration, while that of $\sin x$ and $\cos x$ in Chapter XII is based on power series. To provide enriched illustrations at an earlier stage, the author summarizes the properties in Chapter IV, referring ahead for the proofs, and stating that these functions will not be used in any general theorems forming the foundation of analysis.

For the most part, the author sets himself and maintains a high standard of precision but the reviewer noticed a few exceptions. On page 72 and elsewhere in uniformity arguments he seems to imply that the $\eta(\varepsilon)$ such that $|f(x') - f(x)| < \varepsilon$ if $|x' - x| \leqq \eta$ is uniquely defined. Again, several of the statements in section 4.2 on infinitesimals require revision. Finally in the theorem on functional dependence on p. 267 the conclusion that the functional relation is the same for all values is erroneous, as Bôcher pointed out.

In a few cases the statements of theorems are likely to mislead a beginner who fails to read carefully the notes in fine print interpreting them, as on pages 73 and 292.

The author's style is concise, and there are very few misprints.

The book provides an additional not too formidable reference for the student making his first acquaintance with rigor in analysis.

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## THE ENDOCRINE FUNCTION OF IODINE

*Endocrine Function of Iodine.* By WILLIAM T. SALTER. Pp. xviii + 351. Cambridge, Mass.: Harvard University Press. 1940. $3.50.

THE text is divided into eleven chapters as follows: 1. Iodine balance and endocrine balance; 2. Iodine stores in body tissues; 3. Iodine compounds of biological importance; 4. Circulating iodine; 5. Thyroid activity; 6. Endocrine balance; 7. Iodine and the pituitary-ovarian axis; 8. Neurological influence; 9. Iodine balance; 10. Radioactive iodine; 11. Clinical problems. Eighty-five tables and charts are incorporated in the text.

The value of several of the chapters, particularly 2, 4, 7 and 9, depends on the critical analysis and evaluation of data obtained largely by microchemical methods for iodine estimations. These data in turn are dependent upon the accuracy of the methods used. The author is fully aware of the shortcomings of the best

[1] R. L. Roudabush, SCIENCE, 89: 79, 1939.

[2] H. E. Ewing and I. Fox, SCIENCE, 88: 427, 1938.

microchemical methods at present available and also of the evolution of these methods during the last twenty years. Iodine values obtained during this period have in general progressively decreased as the methods have improved. Yet in these chapters older data are incorporated with the new. Thus the normal blood iodine is stated to be "rarely less than 5 micrograms per cent. or more than 20 micrograms per cent." Judged by the concentrations of other normal constituents of the blood, fasting normal blood iodine is probably more constant than present data indicate. The question always arises, Are we measuring only iodine? and the answer at present is that we are not. Such a question does not arise in the older work where only direct measurements of iodine were made, using material containing more than 100 micrograms of iodine per gram.

Chapter 10 on radioactive iodine is the outstanding chapter. It is an excellent summary of the work to date in this very recent and accurate application of a product of the cyclotron-"tagged" iodine, to the problem of the endocrine function of iodine. As work progresses, and it certainly will progress rapidly with "labeled" iodine, the bizarre normal values reported for iodine in the various tissues, using microchemical methods, will be checked by the more accurate microphysical methods and one may then expect that "normal" tissue iodine will be defined within narrower limits. At that time one may, perhaps, determine the iodine balance with the accuracy of a Ca, P or N balance. The recent discovery by Hamilton and Soley that another product of the cyclotron-element 85 or "eka-iodine" is selectively taken up by the thyroid gland is properly emphasized. As the author points out, radioactive iodine gives investigators a fascinating new tool which should greatly improve the accuracy of future iodine determinations and thereby further extend our knowledge of the biological importance of iodine.

Chapter 8 is the poorest. There is no convincing evidence that the rich extrinsic nerve connections, both sympathetic and parasympathetic, play an important role (other than vasomotor) in thyroid activity; while against this there is an easily proven humoral factor, first demonstrated by thyroid transplantation, which the author does not mention, by cold and by *in vitro* tissue cultures. There are some minor clerical mistakes—as that Coindet reported on the treatment of goiter with iodine in 1811 and some confusing ones caused merely by the omission of "per cent." in the expression "mgm. per cent." (p. 100).

An appendix giving four methods in detail for estimating varying amounts of organic iodine, together with some of the general properties of iodine, materially increases the practical usefulness of the book. The sequential arrangement of the subject-matter has been well considered. A bibliography of 588 complete references and a good subject index complete the volume.

DAVID MARINE

# SOCIETIES AND MEETINGS

## INDIANA ACADEMY OF SCIENCE

THE fifty-sixth annual meeting of the Indiana Academy of Science was held on Thursday, Friday and Saturday, November 14, 15 and 16, 1940, at Muncie, Indina, with Ball State Teachers College as the host institution. Over 400 scientists were in attendance.

The general meetings were presided over by Frank N. Wallace, state entomologist, and the principal papers on the general program were given by Glenn A. Black, Indiana State Historical Society, on "Archeology at the Angel Mounds Site," and T. G. Yuncker, DePauw University, on "Life and Customs Among the Samoans." The necrology was read by Will E. Edington, DePauw University. The academy lost 18 members by death during the past year.

At the nine divisional meetings on Friday afternoon 104 papers were read.

The annual banquet was held on Friday evening, following which President Wallace spoke on "Fighting the Japanese Beetle in Indiana." This meeting closed with the election of the following officers: *President,* Paul Weatherwax, Indiana University; *Vice-president,* Edward Degering, Purdue University; *Secretary,* Winona Welch, DePauw University; *Treasurer,* William P. Morgan, Indiana Central College; *Editor of the Proceedings,* P. D. Edwards, Ball State Teachers College; *Press Secretary,* Will E. Edington, DePauw University; *Divisional Chairmen:* Anthropology, Thomas B. Noble, Indianapolis; Bacteriology, C. G. Culbertson, State Board of Health, Indianapolis; Botany, R. E. Cleland, Indiana University; Chemistry, J. L. Riebsomer, DePauw University; Geology and Geography, Robert Karpinski, Indiana State Teachers College; Mathematics, Will E. Edington, DePauw University; Physics, R. E. Martin, Hanover College; Psychology, Harry N. Fitch, Ball State Teachers College; Zoology, W. E. Martin, DePauw University. R. E. Cleland, Indiana University, and Carl Means, Butler University, were elected fellows. The 1941 annual meeting will be held in Greencastle, Indiana, with DePauw University as the host institution.