in the livers of rats which had previously received a selenium ration at levels of 70, 35, and 177.5 p.p.m.

H. A. SCHNEIDER

UNIVERSITY OF WISCONSIN

NORTH AMERICAN FISH-HOOKS

BIREN BONNERJEA in his recent article in SCIENCE,[1] "North American Fish-Hooks," states that he has come to the conclusion that the barbs on fish-hooks (in America) might have been an original invention, concluding the article by saying, "it seems to me that ethnographers and archeologists in the field would do well to bear this [looking for proof to that end] in mind."

While in charge of the Quileute Indians at LaPush, Washington, from 1905 to 1909, the writer did much excavating about the hill on which the Indian village is situated. The first two feet of debris there included numerous Hudson Bay beads, as well as other white man's things. Below this level only aboriginal things were found, among which were many Indian fish-hooks, of the barbed-outside type, these being found often in the lowest debris exposed there, often six feet below the stratum that contained the blue trade beads. This proves conclusively that the barbed hooks were in use before the coming of the white man to that region.

ALBERT B. REAGAN

BRIGHAM YOUNG UNIVERSITY

TERMITES IN CENTRAL NEW YORK STATE

DURING a recent discussion on the distribution of Termites, mention was made of the scarcity of these interesting insects north of the Mason and Dixon line.

In the late spring of 1933, a nest of Termites (*Reticulitermes flavipes*) was discovered on the north bank of Cascadilla Creek, several hundred yards southeast of the Cornell University stadium, by Mr. Wade H. Hadley, Jr., and the writer. Note of this northern station for this species of Termite might be of interest to the entomologist.

A. E. ALEXANDER

BUFFALO MUSEUM OF SCIENCE

SCIENTIFIC BOOKS

THE AUTONOMIC NERVOUS SYSTEM

The Autonomic Nervous System. Anatomy, Physiology, and Surgical Treatment. By JAMES C. WHITE, assistant professor and tutor in surgery, Harvard Medical School, assistant visiting surgeon, Massachusetts General Hospital, Boston. xviii + 386 pp. The Macmillan Company, 1935. Price $7.00.

THIS important monograph written by a surgeon is a highly significant contribution both to the anatomy and the physiology of the autonomic nervous system. In addition it represents the most authoritative clinical discussion of surgery of the autonomic nervous system that has yet appeared. After a brief historical account of the autonomic system, in which the date and title of Eustachius' celebrated plates are erroneously stated and the name of Gaskell is not to be found, White gives an excellent brief discussion of the anatomy of the autonomic nervous system which can be safely recommended to students. Indeed it is much more complete and concise than that to be found in any current text-book of anatomy or physiology. It is to be regretted, however, that the unimaginative publishers have virtually ruined White's excellent tabular summary of the innervation of the principal organs on pages 35–46 by lack of suitable indentation and complete disregard for the niceties of typography. The chapter on general physiology is sound, but dull, suggesting that too many physiologists tried to help the conscientious author.

The most significant disclosure in the book is described on pages 92–98 in which it is pointed out that the conventional operation for removing the sympathetic supply of the upper extremities destroys the cells of origin of the post-ganglionic fibers, whereas the conventional operation for the removal of the sympathetics of the lower extremities (ablation of lumbar ganglia 1, 2, 3 leaving intact the lower lumbar and sacral ganglia) leaves the cells of origin of the post-ganglionic fibers virtually intact. When the post-ganglionic cells are removed the tissues formerly innervated by them become sensitized to adrenaline. Consequently when such an animal or a human being secretes adrenin or is given adrenaline, extreme vasoconstriction occurs in the sensitized part. This, White argues, gives an intelligent physiological explanation for the virtual failure of the conventional operation for sympathectomy of the upper extremity. Having pointed this out, White then describes a procedure for pre-ganglionic denervation of the upper extremity, and in the few cases thus far tried this gives more satisfactory immediate results than the older procedure. It is based upon the fact, originally disclosed by Langley and long overlooked, that the pre-ganglionic vasoconstrictors of the upper extremities emerge from the spinal cord at levels below the third or fourth thoracic, often extending as far down as the tenth thoracic. Consequently when the thoracic sympathetic trunk is merely cut through at Th. 3 or 4, the pre-ganglionic vasoconstrictors of the upper extremity are entirely removed and the post-ganglionic cells remain intact. Regeneration, however, may occur.

White, like Livingston, whose recent book, "The

[1] 82: 2134, p. 492.

Clinical Aspects of Visceral Neurology with Special Reference to the Surgery of the Sympathetic Nervous System," covers a somewhat similar field, is outspoken on the subject of visceral pain. He believes that certain types of pain are intimately associated with the sympathetic nervous system and since such pain is mediated by afferent fibers passing in the sympathetic trunk it can not be completely abolished in an extremity by mere section of its somatic nerves.

In the clinical sections of the book, in which no extravagant claims are made, the pathological conditions and abnormal physiological states which may be cured or ameliorated by surgical procedures involving the autonomic nervous system are discussed. Peripheral vascular diseases, especially those which fall into the Raynaud's syndrome, are discussed at length and salutary results are recorded; relief from intractable pain, *e.g.,* of the extremities and of cardiac origin, is discussed and also the problem of hypertension. In discussing the gastro-intestinal tract White points out that Hirschsprung's disease in children may be dramatically benefited by sympathetic denervation. The final section relates to surgical procedures and to the technique of alcohol injection of sympathetic ganglia which White has done so much to develop. The book is provided with good bibliographies, clear illustrations and an excellent index.

YALE UNIVERSITY J. F. FULTON

THE THEORY OF VALENCY

The Optical Basis of the Theory of Valency. By R. DE L. KRONIG, University of Groningen. The Macmillan Company, New York. x + 246 pp. Price, $4.50.

THIS new volume in the Cambridge Series of Physical Chemistry is an excellent general survey of the contributions of modern physics to the problem of chemical valence. For the chemically stable molecules x-ray and electron diffraction studies are available. The chemically unstable molecules, the chemists' free radicals, may be studied by spectroscopic methods, which are applicable also to the stable molecules, both diatomic and polyatomic, to the latter with ever-increasing success. All these studies are contributing to a quantitative picture of the configuration, shape, size and interatomic motions and forces of molecules. The author has stated the results of mathematical physical analyses of these problems, but without any detailed derivation. This constitutes at once an advantage and a limitation of the book. The beginner in this field and those specializing in other fields anxious to know, in general, what has been accomplished will find the book an excellent introduction. The basic material necessary to an understanding of the approach to chemical binding, as interpreted by Heitler-London, Slater-Pauling and Hund-Mulliken, is presented in outline. The stability of valence compounds as revealed by reaction rate theory is considered to lie outside the scope of the book. The editor of the series might bear this in mind when considering other volumes to be presented. The recent article by van Vleck and Sherman in Reviews of Modern Physics on "The Quantum Theory of Valence" is an illustration of a more advanced treatment of the subject to which this present volume forms a satisfactory introduction.

HUGH S. TAYLOR

PRINCETON UNIVERSITY

SOCIETIES AND MEETINGS

THE TENNESSEE ACADEMY OF SCIENCE

THE November meeting of the academy for 1935 was held on Friday and Saturday, November 29 and 30, at George Peabody College, Nashville, Tennessee.

The most noteworthy feature of the meeting was its generality. Twenty-five of the forty-three papers listed on the program were by representatives of twelve different schools: the University of Tennessee, a state college and a church college, in East Tennessee; Vanderbilt University, Peabody College, two state colleges, a church college and a city school in Middle Tennessee; two church colleges in West Tennessee; a high school in Kentucky. No two schools were of the same denomination. Seven papers were by representatives of five different departments of the state. The Tennessee Valley Authority contributed two papers, the U. S. Weather Bureau one, the National Park Service one. The program committee classified the papers listed for the general section under fourteen branches of science—geology leading with five, biology next with three.

Ferns claimed chief attention at the session of the botanical section, Dr. L. R. Hester, chairman. Other subjects included trees, bryophyles, algae and fungi. Dr. George R. Gage, of Vanderbilt University, reported that the Dutch elm disease has not yet been detected in Tennessee.

The presidential address was delivered by Dr. George M. Hall, professor of geology, University of Tennessee, at the dinner at the Hermitage Hotel on Friday evening. His subject was "The Economical and Cultural Value of Geology." On Saturday afternoon, Professors Jesse M. Shaver and Aaron J. Sharp led an excursion in search of native ferns and mosses.

The editor of the *Journal of the Tennessee Academy*