convolution of opposite phase, and all the while progressing in a general direction parallel to the axis of motion. At this point it may be asked, what advantage is secured by this curvilinear motion? The chief advantage seems to be that those portions of the body placed transversely to the axis of motion furnish better fulcra from which the anterior parts of the body may be projected forward. If this is the correct explanation, then, during the forward movement of that part of the body anterior to the transverse flexure, the scutes are for the most part passive, and the anterior parts are projected by the median muscles. This seems to be a good reason for believing that the scutes do not act in continuous progression from before backwards, but intermittently and perhaps to some extent simultaneously, being interrupted by shores and pulls which annul and complicate their action. The problem of their motion, however, is a difficult one, and more experimentation is needed before the laws of their action can be confidently and fully formulated.

J. LAWTON WILLIAMS.

Bonnetsville, N. Y., Aug. 18.

Black and Bright Bulb Thermometers in Vacuo.

In reply to an inquiry in this journal for Aug. 7, I would say that the formulae for these radiation thermometers will be found in the "Annual Report of the Chief Signal Officer for 1885," pp. 131-134.

Professor Ferrel has also made an exhaustive study of a special investigation of a large number of these thermometers, which will be found in "Professional Papers, Signal Service," XIII, pp. 34-50.

Several notices have appeared in Nature from time to time. It would seem that serious discrepancies have been found in these instruments, and it is still a mooted question as to their source. Professor Ferrel found, as was to be expected, that the ventilation of the bulb was a most important factor.

H. A. HAZEN.


AMONG THE PUBLISHERS.

The most timely feature of the September number of the New England Magazine is an article on the late "Edward Burgess and His Books." The writer is A. G. McVey, the yachting editor of the Boston Herald.


In the Atlantic Monthly for September John Fiske has a paper on "Europe and Cathay," which discusses the reason why the early Norse discoverers of America were not real discoverers. In the same number is a description of the Japanese Feast of Lanterns and the Market of the Dead, by Lafcadio Hearn.

PUBLICATIONS OF THE UNIVERSITY OF PENNSYLVANIA.

SERIES IN PHILOLOGY, LITERATURE, AND ARCHAEOLOGY.

Vol. I. now ready.

1. Poetics and Verse Criticism of the Reign of Elizabeth. By Hans C. Bolling, A.M., Assistant Professor of English Literature. $1.00.

2. A Fragment of the Babylonian "Dibbanna" Epic. By Morris Jastrow, Jr., Ph.D., Professor of Arabic. 60 cents.


The Terracina Period of Marcus V. Bassus. By H. Howard Fiske, Ph.D., LL.D., Professor of Comparative Philology and Manuscript. By Daniel G. Brinton, M.D., Professor of American Archaeology and Linguistics.

A Monograph on the Temples. By Horace Howard Fiske, Ph.D., LL.D., Professor of Comparative Philology and Manuscript. By Daniel G. Brinton, M.D., Professor of American Archaeology and Linguistics.

Recent Archaeological Explorations in New Mexico. By Charles H. Ambrose, M.D., Curator of the American Collections.


The Life and Writings of George Gesnudi. By Paul H. Schilling, A. M., Assistant Professor of English Literature.

The Papers of this Series, prepared by Professors and others connected with the University of Pennsylvania, will take the form of Monographs on the subjects of Philology, Literature, and Archaeology, of about 200 to 500 pages each. The price to subscribers to the series will be $2.50 per volume; to others, $2.75 per volume.

Each Monograph, however, is complete in itself, and will be sold separately. It is the intention of the University to issue these Monographs from time to time as they shall be prepared.

Each author assumes the responsibility for his own contribution.

N. D. C. HODGES, 47 Lafayette Place, New York.

BOOKS: How to get them. If there is any book or pamphlet that you want, write to the Science Book Agency, 47 Lafayette Place, New York.
— "Practical Work in Organic Chemistry," by Frederick William Streetfield, just published by Spon, is one of the Finbury Technical Manuals. The Finbury Technical College gives instruction in both day and evening classes to those who wish to qualify themselves for filling positions requiring technical skill. The author, who is the demonstrator of chemistry at Finbury, after describing the operations in organic chemistry, such as purification, crystallization, determination of melting point, and the mode of analysis, devotes most of his space to oxalic acid, alcohol, the fats and oils, and the coal-tar products.

— Everyone interested in the betterment of public roads and highways should read the article, in the September Lippincott's Magazine, by John Glimmer Speed on "Country Roads and Highways." That we have very bad roads in this country is an accepted fact, but few realize how very bad they are in comparison with those of many foreign countries. Besides calling attention to the wretched condition of our roads, and telling what has been done in different States for their betterment, Mr. Speed offers some valuable suggestions.

— The Academy of Music in this city will open its coming season on Thursday, Sept. 3, with a romantic spectacular play called "The Soudan." This drama was produced, and ran for two seasons, at the Drury Lane Theatre, London, under the title of "Human Nature." The story, which is a strong one, deals with events which occurred during the campaign for the relief of Gen. Gordon and other Europeans, who were held prisoners at Khartoum by the Arabs, during the war in the Soudan. The scenes, which are laid in England and Egypt, afford an excellent opportunity for a display of grandeur such as few other attractions of the kind can boast of. The Arab city, attacked and carried by English soldiers, or the surging crowd at Trafalgar Square, London, cheering and shouting words of welcome to the victorious Guards, makes a never-to-be-forgotten stage-picture.

### POPULAR MANUAL OF VISIBLE SPEECH AND VOCAL PHYSIOLOGY.

For use in Colleges and Normal Schools. Price 50 cents
Sent free by post by

N. D. C. HODGES, 47 Lafayette Pl., N. Y.

### PRIZE ESSAYS OF THE AMERICAN PUBLIC HEALTH ASSOCIATION.

Practical Sanitary and Economic Cooking Adapted to Persons of Moderate and Small Means. By Mrs. Mary Bixman Ames. 12mo. 186 pp. Cloth, $0.40.


The four essays (Nos. 1, 2, 3, 4) in one volume of nearly two hundred large octavo pages, thoroughly indexed. Cloth, 26 cents.

N. D. C. HODGES, 47 Lafayette Place, New York.

### Speech Reading and Articulation Teaching.

By A. MELVILLE BELL.

Price, 25 cents.

Practical Instructions in the Art of Reading Speech from the Mouth; and in the Art of Teaching Articulation to the Deaf.

(This Work—written at the suggestion of Miss Sarah Fuller, Principal of the Horace Mann School for the Deaf, Boston, Mass.—is, so far as known, the first Treatise published on "Speech Reading.")

### FROM PRINCIPLES OF INSTITUTIONS FOR THE DEAF.

"Admirable in its consciousness, clearness and freedom of expression, the simplicity and perfection of this little book."

"Full of exact and helpful observations." "A very interesting and valuable work." "The rules are clearly given and will be of great utility."

"Every articulation teacher should study it."

"A model of clearness and simplicity, without having any of the puzzling symbols that trouble the common mind... The exercises given in speech-reading from the lips are especially interesting, and of great importance for the student of phonetics."

— Modern Language Notes.

### Old and Rare Books.

Back Numbers and complete sets of leading Magazines, Rates low. AM. MAG. EXCHANGE, Schenectady, N. Y.

### DO YOU INTEND TO BUILD?

If you intend to build, it will be a mistake not to send for "Sensible Low-Cost Houses," now arranged in three volumes. In them you will find perspective views, floor and plans, descriptions, and estimates of cost for 105 tasteful, new designs for houses. They also give prices for complete working plans, details, and specifications, which enable you to build without delays, mistakes or quarrels with your builder, and which any one can understand. Vol. I. contains 35 copyrighted designs of houses, costing between $500 and $1000. Vol. II. contains 35 copyrighted designs, $1000 to $2000. Vol. III. contains 35 copyrighted designs, $2000 to $5000. Price, $1.00 each, or $5.00 for the set.

"Colonial Houses," a volume showing Perspectives and Floor Plans of houses arranged in the inimitable style of the Colonial Architecture, and having all modern arrangements for comfort, Price, $2.00.

"Picturesque Houses for Forest and Shore!"—This shows Perspectives and Floor Plans of new designs for Summer Cottages, which are romantic, convenient, and cheap. Price, $1.00, by mail.

N. D. C. HODGES, 47 Lafayette Place, New York.
CONTENTS OF JULY NUMBER:
• Parasitic Fungi Affecting the Higher Animals
• The History of the Microscope
• Our Naturalists’ Pages
• Protocols of Naturalists
• The Poison of Toads
• Bright Writings in Spiders
• Essays, Preservation of Antimony in Certain Animals
• Review of *Waxly Scientific Society.

Price, postpaid, $2.

BY THE SAME AUTHOR.

RACES AND PEOPLES.

"The book is good, thoroughly and well written, one of the best accessible elementary ethnologies in our language." — The Christian Union.

"The work will be of genuine value to all who wish to know the subject of what has been found out about the indigenous Americans.—Nature.

"A masterly discussion, and an example of the successful education of the powers of observation." — Philadelphia Daily News.

Price, postpaid, $2.

THE MODERN MALADY; or, Sufferers from Nerves.

An introduction to public consideration from a non-medical point of view, of a condition of ill-health which is increasingly prevalent in all ranks of society. In the first part of this work the author dwells on the errors in the minds of treating Neuropsychia, consequent on the wide ignorance of the subject which still prevails; in the second part, attention is drawn to the principal causes of the malady. The allegory forming the introduction is a fact, a brief history of nervous exhaustion and the modes of treatment which have at various times been thought suitable to this most painful and trying disease.

By CYRIL BENNETT. 12th. $1.50.

READY SOON.

THE MODERN TORNADO.

A book which will find many readers. The chapter on the "Tornado" is a popular treatise on one of the most dangerous phenomena of nature, the subject being treated in detail.

By HERBERT ELWOOD. 12th. $1.50.

THE MODERN TORNADO—Continued.

VI. TIME-RELATIONS OF MENTAL PHENOMENA.

By J. A. YATES. 12th. $1.50.

VII. HOUSEHOLD HYGIENE.

By F. W. HOLLAND. 12th. $1.50.

VIII. THE FIRST YEAR OF CHILDHOOD.

By H. M. BALDWIN. 12th. $1.50.