

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 succession from before backwards, but intermittently and perhaps to some extent simultaneously, being interrupted by shoves 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.

Hornellsville, 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 formulæ 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 bulbs was a most important factor.

H. A. HAZEN.

Washington, D.C., Aug. 18.

#### 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 Boats." The writer is A. G. McVey, the yachting editor of the Boston *Herald*.

—D. C. Heath & Co., Boston, will issue, about the first of September, "Andersen's Marchen," selected, arranged, and edited, with notes and vocabulary, by Professor O. B. Super of Dickinson College, Pa.

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

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—“Practical Work in Organic Chemistry,” by Frederick William Streatfeild, just published by Spon, is one of the Finsbury Technical Manuals. The Finsbury 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 Finsbury, 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 Gilmer 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.

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