

burnt stones below the surface. There are traces of villages in the country surrounding the fort. The author expresses his conviction that the fort possesses nothing of a religious nature.

A pavement which has been found inside may have been used as a place for the war-dances or councils of the tribes assembled in the fort. The author believes that these tribes were in advance of the Shawnees, the Delawares, and others who occupied the territory in 1787. But they did not know the art of smelting, though they used hammered copper and galena. In concluding, the author calls attention to the similarity of the arts of the Mandans and the tribes who inhabited Fort Ancient, and expresses the opinion that they may have been the builders of the works. The book proves to be the result of a very careful and detailed investigation, for which ethnologists will be thankful to the author, even should his theories not find general acceptance. The endeavor, which appears throughout the book, to represent the finds and the methods in which they have been obtained as clearly as possible, which is supported by the excellent illustrations accompanying the descriptions, gives the work value aside from all theoretical considerations.

Railroad Engineers' Field-Book and Explorers' Guide. By H. C. GODWIN. New York, Wiley. 16°.

To the many railroad engineers who do not consider themselves expert mathematicians this field-book will prove of exceptional value. It contains, in small compass, every thing that can reasonably be sought for in a book of the kind, intended solely for use in the field; leaving those things which pertain to extreme accuracy, and which may be rarely needed, for a supplementary or complementary volume, which may be assigned a place with the camp equipage. The idea which prompted the preparation of the volume is good, and we think it has been well worked out. The author has avoided as much as possible the intricacies of mathematics, and at the same time has produced a work of more general application than might have been expected by engineers familiar with books of its kind.

The book is divided into four principal parts, the first dealing with railroad location, the second with railroad construction, the third with reconnaissance and exploratory surveys. The fourth is devoted to general information of a miscellaneous but no less useful nature. To these are added an appendix and a set of tables. The book is well adapted to the use of railroad engineers engaged on location and construction work, as well as to the use of the explorer in making exploratory surveys.

AMONG THE PUBLISHERS.

READERS of all classes, young and old, will be glad to know that the Scribners are issuing a new book by Mrs. Frances Hodgson Burnett. It will be entitled "Little Saint Elizabeth, and Other Stories," and is an attractive picture of child-nature.

— The second volume of Donald G. Mitchell's latest work, "English Lands, Letters, etc.," will soon be published by the Scribners. It will contain the author's talks about historical and literary England from the time of Elizabeth to Queen Anne, Shakspeare being the first, and Swift the last, personage of importance who passes under review.

— A timely article is "Stanley's Emin Pasha Expedition" in *Lippincott's* for April. A concise biographical account of Emin Pasha is given, and also the reason of Stanley's expedition, with other information.

— Mr. Marston, of the London publishing-house of Sampson Low, Marston, & Co., wrote recently from Cairo, where he was in company with Mr. Henry M. Stanley, "Mr. Stanley is devoting absolutely the whole of his time, from early in the morning (sometimes as early as 6 o'clock) till late at night, in writing his great book. I have read a good part of the text, and I think I may say, without being accused of puffing, that it is profoundly interesting. I am happy to add that Mr. Stanley was well pleased to learn from me that I had completed satisfactory arrangements for si-

multaneous publication in France by Messrs. Hachette & Co., in America by Messrs. Scribner's Sons, in Germany by Mr. Brockhaus, in Spain by Espasa & Co., in Italy by Messrs. Treves, and in Scandinavia by Mr. Mallings."

— There is an article on "Egypt at Home," by Rev. Dr. W. C. Winslow, vice-president of the Egypt Exploration Fund, in the April number of the *New England Magazine*. It is an account of the Egyptian collection in the Boston Museum of Fine Arts, the most important Egyptian collection in America, and is illustrated. The number will also contain a full page portrait of Miss Edwards, from a recent photograph by Sarony, with an article upon her work by Mrs. Sallie Joy White, and several facsimiles of passages from her letters and manuscripts.

— To Shakspeare students the plan and scope of Dr. Furness's "Variorum Shakspeare" are known, as are the pains, judgment, and critical faculty expended upon them. Each play as it appears brings into one focus all the wealth of a great Shakspearian library, so arranged as to be immediately accessible. "As You Like It," the eighth volume of this splendid edition, will be published by J. B. Lippincott Company on April 25. The volumes previously issued are "Romeo and Juliet," "Hamlet" (two volumes), "Macbeth," "King Lear," "Othello," and "The Merchant of Venice."

— The publishers of the *Electrical World* have secured the services of Dr. Louis Bell, who will in future have editorial control of that enterprising journal. T. C. Martin and Joseph Wetzler, who have heretofore edited the *Electrical World*, have taken editorial charge of the *Electrical Engineer*, and that well-known paper will henceforth appear as a weekly.

— Civil-service reform has a champion in Mr. Oliver T. Morton, who, in a paper called "Some Popular Objections to Civil-Service Reform," which appears in the *Atlantic* for April, is not afraid to say that the spoils system "is at war with equality, freedom, justice, and a wise economy, and is already a doomed thing fighting extinction. Its establishment was in no sense a popular revolution, but was the work of a self-willed man of stubborn and tyrannical nature, who had enemies to punish and debts to pay." This certainly strikes no uncertain note. The article is divided into sections, each one of which is headed by a paragraph which embodies some objection to the movement.

— The April issue of the *Quarterly Journal of Economics*, published for Harvard University, will contain articles by President Francis A. Walker on "Protection and Protectionism," in which arguments for and against protection are temperately discussed; by Professor Taussig of Harvard, on the "Silver Situation, its History and its Dangers;" E. C. Gonner of Liverpool, Eng., on "Ricardo and his Critics;" F. B. Hawley of New York, on "Profits and the Residual Theory;" N. Matthews, jun., of Boston, on the "Taxation of Mortgages in Massachusetts." There will also be notes and memoranda on the law against socialists in Germany, on recent works on finance and political economy, and the usual bibliography.

— Of the contents of *Outing* for April, we note "Signaling for Antelope on the Staked Plains," by William H. Johnston, jun.; "Wheel and Camera in Normandy," by J. W. Fosdick; "Melton Mowbray; or, Fox Hunting in the Shires," by "Merlin;" "Some Defects in Tennis," by D. C. Robertson; "Tennis Scores," by William Strunk, jun.; "Bowling for Women," by Margaret Bissland; and "Yacht Racing in Great Britain," by F. C. Sumichrast.

— The wide-felt interest in the present discussion of the revision of the Westminster Confession of Faith has manifested itself in a steadily increasing demand for the recent publications relating to the subject. The Scribners have brought out a third edition of Dr. Briggs's "Whither?" and the pamphlets entitled "Biblical History," and "Whither? O, Whither?" by Dr. McCosh; also a new edition of Dr. Schaff's "Creed Revision," with an appendix containing a report of the discussion in the Presbytery of New York. The same publishers are issuing a new contribution to the subject by Dr. Shedd, entitled "The Proposed Revision of the Westminster Standards."

— The Scribners will publish immediately a small book by George W. Cable, entitled "The Negro Question," containing the address delivered by the author on Washington's Birthday before the Massachusetts Club in reply to the memorable speech by the late Henry W. Grady; also several open letters by Mr. Cable on this subject.

— The Scribners will issue shortly the first of a series of interesting memoirs of "Three Famous French Women," translated from the French of M. Imbert de Saint-Amand, by T. S. Perry. The subject of the first volume will be the Empress Josephine, and will be entitled "The Wife of the First Consul." Other works will follow on Marie Antoinette and the Empress Marie Louise.

LETTERS TO THE EDITOR.

Means of increasing the Accuracy of locating Vessels at Sea.

IN looking over some meagre accounts of the recent meeting of the International Maritime Congress, I failed to find any mention of a very important branch of navigation to which my attention was attracted some years ago. I refer to the question of the present accuracy of the instruments for determining the position of a ship at sea, and the steps that must be taken in order to improve this accuracy. The reasons that make this an important matter are so obvious that it is not necessary to catalogue them. I need only say that in approaching any coasts, dangerous reefs, shallow waters, and, in the case of sailing-vessels, the paths regularly frequented by steamers, it is of the greatest importance to be able to locate the ship's position with all the accuracy attainable.

In 1881 Professor W. A. Rogers, the eminent American astronomer and physicist, read a paper before the Naval Institute at Annapolis, published in the "Proceedings" of the institute, bearing the title "The Co-efficient of Safety in Navigation."

This paper is spoken of by Commander P. F. Harrington, U.S.N., as being "remarkable for the extent and thoroughness of its investigations, and valuable in the application of its results to the practice of navigation. . . . Its practical conclusion and warning ought to be impressed upon every man who is permitted to lay a vessel course."

In this paper Professor Rogers shows the various errors which enter into the determination of a ship's location at sea; and he determines, finally, an average error and a possible error of position from a large number of observations, as shown by logs of vessels in various quarters of the globe. Upon his inquiring of a number of sea-captains as to the limits within which a ship's place can be ordinarily determined, most of them said a mile was the limit, some few said half a mile, and only one man gave so high an estimate as five miles.

The chief sources of error seem to be those pertaining to the compass, chronometer, and sextant. For the compass, Professor Rogers does not come to any very definite conclusion; at least, no numerical estimates of error are made.

A discussion of the rates of a large number of chronometers shows, that, for a chronometer of average excellence, at the end of twenty days an average error of 3.6 miles must be expected, and an error of 11.5 miles must be looked out for. The error of the chronometer increases with the time occupied in the voyage; and a discussion of the errors of one hundred chronometers by Mr. Hartnup of Liverpool (and probably no more capable man has ever examined into the matter) showed that at the end of a voyage of twelve months the error in one of the ship's positions was 524 miles. Another extreme instance cited is the case of Lord Anson's voyage around Cape Horn, in which one ship "actually made land on the wrong side of the continent, the error of position being over 600 miles."

For the sextant observations it is difficult to determine the limit of accuracy; but "the average error of a single observation at sea is not far from 3 miles, and the average co-efficient

Publications received at Editor's Office,
March 17-22.

- EARL, A. G. The Elements of Laboratory Work. London and New York, Longmans, Green, & Co. 179 p. 12°. \$1.40.
- ELECTRICS, Practical: A Universal Handy-Book on Everyday Electrical Matters. London and New York, Spon. 125 p. 18°. 75 cents.
- GEDDES, P. and THOMSON, J. A. The Evolution of Sex. New York, Scribner & Welford. 322 p. 12°. \$1.25.
- HURST, J. T. Spon's Tables and Memoranda for Engineers. 10th ed. New York, Spon. 140 p. 48°. 40 cents.
- MAYCOCK, W. P. Practical Electrical Notes and Definitions, for the Use of Engineering Students and Practical Men. London and New York, Spon. 130 p. 24°. 60 cents.
- NEW YORK State Board of Health, Eighth Annual Report of the. Transmitted to the Legislature Feb. 27, 1888. Albany, Troy Press Co., pr. 348 p. 8°.
- Same. Ninth Annual Report Transmitted to the Legislature Feb. 26, 1889. Albany, Troy Press Co., pr. 609 p. 8°.
- SPRAGUE Electric Railway & Motor Co., Applications of Electro-Motive Power by the New York, Sprague Co. 47 p. 8°.
- Stationary Motors, Facts about the. New York, Sprague Co. 31 p. 8°.
- STREET Railway Companies, To Managers of. New York, Sprague Electric Railway and Motor Co. 26 p. 8°.
- TAYLOR, I. The Origin of the Aryans. New York, Scribner & Welford. 339 p. 12°. \$1.25.
- TUNZELMANN, G. W. de. Electricity in Modern Life. New York, Scribner & Welford. 272 p. 12°. \$1.25.

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