— D. C. Heath & Co. of Boston have in preparation an "Industrial and Educational System of Drawing," by Langdon S. Thompson, A.M., recently professor of the subject in Purdue University, and now supervisor of drawing in the schools of Jersey City.

— "Washington's Letter to Benjamin Harrison," governor of Virginia in 1784, on the Potomac navigation scheme and the general question of the opening of the West, has just been added by the directors of the Old South studies in history to their new general series of Old South Leaflets. They have also added Washington's circular letter to the governors of the States, on disbanding the army in 1783, — a letter which Washington himself felt to be so important that he termed it his "legacy" to the American people, and which discusses the political problems of the time so seriously and thoroughly that it should be read everywhere to-day along with the farewell address. The "Farewell Address" (No. 4), and the "First Inaugural," April 30, 1789 (No. 10), have already appeared in this series.

— In the *Atlantic Monthly* for May is a paper on "Temperance Legislation, its Uses and Limits," written by Charles Worcester Clark. Mr. Fiske contributes one of his historical papers on "Brandywine, Germantown, and Saratoga." Mr. W. H. Bishop writes a graphic sketch of "The Paris Exposition in Dishabille," giving its appearance when the buildings were just being completed. He also describes the Eiffel Tower, the great landmark of the exhibition. An amusing article on "The Philosophy and Poetry of Tears" is contributed by J. T. L. Preston; Mr. Frank Gaylord Cook writes about "The Lawyer in National Politics;" and reminiscences of famous "Trotting Horses" are given by H. C. Merwin. Josiah Royce contributes the first of two papers on "Reflections after a Wandering Life in Australasia;" another paper of a lighter kind, also having to do with travel, is "At Sesenheim," by Bliss Perry. Sesenheim is the place, not far from Strasburg, where Goethe wooed, won, and ran away from Freiderike.

— G. P. Putnam's Sons add to their announcements "The Ideals of the Republic, or, Great Words from Great Americans," comprising the Declaration of Independence, the Constitution of the United States, Washington's First Inaugural, Washington's Second Inaugural, Washington's Farewell Address, Lincoln's First Inaugural, Lincoln's Second Inaugural, Lincoln's Gettysburg Address. The volume will contain etched portraits of Washington and Lincoln, and will be issued as No. 20 of the Knickerbocker Nuggets. They will also publish a translation of Dante's "Convito," by Katharine Hillard; a third volume in Mr. Phyfe's series of works on pronunciation, entitled "Seven Thousand Words often Mispronounced;" and "An Essay on Money," by James Platt, author of "Business," reprinted, under arrangemeut with the author, from the nineteenth English edition. For the American Historical Association they will issue a "Report of the Proceedings at the Fifth Annual Meeting held in Washington in December, 1888." For the American Society of Church History they will publish Vol. I. of its papers, comprising "The Progress of Religious Freedom as Illustrated in the Toleration Edicts," by Philip Schaff, D.D., president of the society; "Indulgences in Spain," by Henry C. Lea, LL.D.; "The Crisis in the Middle Ages," by James Clement Moffat, D.D.; "Melanchthon's Synergism, a Study in the History of Psychological Dogmatism," by Frank Hugh Foster; "The Influence of the Golden Legend," by Professor E. C. Richardson; and "Notes on Syncretism," by Professor Hugh McDonald Scott.

— Ward, Lock, & Co. have just ready "The Life and Opinions of John Bright," by Francis Watt, fully illustrated. They will publish at once "Camps and Quarters," a series of military sketches and stories by the well-known war correspondents, Archibald Forbes, George Henty, and Charles Williams.

— Houghton, Mifflin, & Co. will shortly publish "The War for Independence," by John Fiske, which will form the first volume of a new series to be entitled The Riverside Library for Young People. This series is intended for boys and girls who are laying the foundation of libraries of their own, and will contain history, mechanics, travel, adventure, natural history, and the best class of fiction. Other volumes announced for this series are "Birds through an Opera-Glass," by Florence A. Merriam; a biography of George Washington, by Horace E. Scudder; and "Up and Down the Brooks," by Mary E. Bamford.

— Harper & Brothers have just issued another volume in the series of English Classics for School Reading, "Fairy Tales in Prose and Verse," selected from early and recent literature, and edited, with notes, by William J. Rolfe. The book is fully illustrated.

— D. Appleton & Co. have ready a revised edition of their "Dictionary of New York." It will be found a comprehensive guide not only to the historic and curious sights, but to the practical as well, such as hotels, the streets, the best modes of travel, restaurants, places of amusement, etc.

— Hubbard Brothers, Philadelphia, have in press an illustrated volume to be entitled "Living Leaders of the World." It will contain short biographies of men and women now most prominent all over the world. The portraits, mostly from new photographs, to accompany these biographies, will be in steel plate, photogravure, and woodcut. Many well-known authors are engaged upon the biographies.

— Theodore Voorhees, assistant general superintendent of the New York Central, will contribute to the May *Scribner's* one of the articles in the Railway Series, explaining the complicated machinery which is necessary to carry on the enormous freight-car service of the country. The fishing article, on "The Land of the Winanishe," will be illustrated from sketches and drawings by Dr. Leroy M. Yale, and L. R. O'Brien, president of the Canadian Academy. The advances in photography which have been made possible by the dry-plate process will be treated by Professor John Trowbridge of Harvard, who will illustrate some unique results by photographs taken under most peculiar conditions, as under water, by lamp and candle lights, and by lightning-flashes.

— D. C. Heath & Co. of Boston have ready for immediate publication, in their series of Science Guides, "Thirty-Six Observation Lessons on Common Minerals," by Henry Lincoln Clapp, master of the George Putnam Grammar School, Boston. It is not an epitome of any work on mineralogy, nor simply a collection of suggestions, but a specific, practical guide for the use of the teacher. By following its plan, the teacher becomes simply a director of the pupils' energies, thus cultivating the scientific habit of thinking and working.

— The Hon. Mrs. Maxwell-Scott of Abbotsford is preparing for publication some hitherto unpublished journals of her great-grandfather, Sir Walter Scott.

LETTERS TO THE EDITOR.

***Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.*

The editor will be glad to publish any queries consonant with the character of the journal.

Twenty copies of the number containing his communication will be furnished free to any correspondent on request.

New Sources of Heat.

UNDER the above heading, Mr. Lorin Blodget of Philadelphia writes to *Bradstreet's*, making several assertions as to the possibility of obtaining heat from air without the use of much carbonaceous fuel, so that it seems worth while to have the known facts in the case ventilated in the columns of *Science*. Will not some of your correspondents show us in how far Mr. Blodget may be right?

Quoting from Mr. Blodget, "in the course of the many improvements and adaptations found necessary to attain the best calorific results, and especially in the use of solid fuels for metallurgic purposes, it is certain that there is a great accession of heat from other sources than the ordinary yield from coal burned. In all cases where a powerful blast is applied to the limited area of a melting furnace, and particularly in the Bessemer converter, the degree of heat generated is greatly in excess of the theoretical yield of the number of pounds of coal consumed.

"The power of any incandescent surface to intensify the heat evolved by simply intensifying the blast is well known in many processes, but such surfaces have not been supposed to constitute a

source of heat distinct from that derived from carbonaceous combustion. It is known that the result is cumulative, but it has not been known that there was another source, in the heat evolved from the air itself. Incandescence of the non-combustible concretion, or crystallization forming the Welsbach hood or burner, is known to be a prolific source of heat as well as of light. And there are many evidences that incombustible materials of like refractory character may and do yield heat largely when incandescent under an air-blast; the presence of carbon, and the normal consumption of carbon and oxygen, not being essential or even attendant conditions.

"As a result of experiments for some years conducted, leading in this direction, and in the earlier part of this period confined to the use of an air-blast with a very small adjunct of hydro-carbon gas, the most intense metallurgic heat was produced without the use of any solid or liquid fuel, and without the production of gases as the products of combustion, in any form of carbonic acid or carbonic oxide. The very small proportions of carbonaceous gas — hydro-carbon gas — used as the means of setting the air-blast on fire not being sufficient to cause delivery of carbonic acid or oxide from the flue, no flue was used, in fact, as an upward delivery, and none was necessary.

"These trials were but steps, however, leading to a more complete substitution of atmospheric combustion by contact with incandescent surfaces, carbonaceous at first, and of anthracite or bituminous coal, the carbon of which would remain intact after hours of evolution of intense heat. The conditions of such contact are still obscure as to the point of original action or the cause of such action; but it is demonstrated that the utmost intensity of heat, not less than 4,000°, can be and is attained with a mere initiative of carbonaceous combustion, and, when once established, may be maintained for an indefinite period by merely preserving the incandescence of the surface. And this may be done by a slight manipulation of the surface brought to incandescence, and with some slight renewal of carbonaceous material.

"The direction of these results is so clear that it is assumed to be a new and practicable method of the evolution of heat for economic purposes. The air itself, which is the only body consumed, becomes a new source of heat, acting independently of the supposed limit of oxygenization or of carbonaceous combustion. Nor is any gaseous or aeriferous compound delivered as the product of such evolution of heat or combustion, if so called. We have applied the term 'combustion' heretofore to all combinations resulting in the evolution of heat enough to burn or disorganize organic matter.

"If the air itself, its nitrogen as well as its oxygen, can be made available as a direct source of heat without the attendant conditions of the formation of waste products, such as carbonic acid or carbonic oxide, the discovery is one of the greatest in human experience. It implies the substitution of an inexpensive natural fuel for the expensive natural and artificials now in use. The mere suggestion appears too great to be credible; but it is absolutely true that this is done experimentally with complete success, and that appliances are already in use, heating the air in large buildings, and melting the most refractory metals in considerable quantities. The intensity of the heat is equal to that of the blow-pipe, while the extent of space to which it is applied is adequate to any requirement for steam-generation or for manipulation of iron or other metals.

"It is only intended here to cite so much of what are admitted facts in heat-production by the usual processes as will show that other and superior aids to heat-production are already reached in many cases, and that the line of reasonable progress lies in the direction of relief from dependence on the combustion of carbon, organic or inorganic, as the source of heat for economic purposes."

X.