

Creatine and hypoxanthine are said, in small doses, to have the power of increasing muscular work, and to cause the muscle to recover rapidly after exertion. Creatine particularly is said to have this power to a great extent. Glycogen is also classed with these substances, and is said to have great power of increasing muscular capability.

In practice, however, we all recognize a difference in the action of the popular mixtures, — tea, coffee, cocoa, etc. In many persons tea will stimulate, and in a few it exercises a marked action on the kidneys and bladder. Coffee, again, will keep some people awake, while tea does not have the same effect with them. With some individuals it acts as a mild aperient. Coca does not seem to have any decided action on the digestive organs or kidneys.

We find, therefore, that the reputation for sustaining the strength, appeasing hunger, and temporarily increasing the physical powers, which coca, kola, coffee, and tea have in the respective parts of the world in which they are indigenous, is borne out by experiment. Moreover, there seems a probability that physiological science will shortly be able to provide a satisfactory explanation of the practical value of these substances.

#### BOOK-REVIEWS.

*Francis Bacon, his Life and Philosophy.* By JOHN NICHOL. Part II. Bacon's Philosophy. Edinburgh, Blackwood. 16°. (Philadelphia, Lippincott, \$1.25.)

THIS is the latest issue in Messrs. Blackwood's series of Philosophical Classics. In the first part of the work, Professor Nichol gave an account of the life of Bacon, and in this he gives an exposition of his philosophy. He first recounts the efforts of previous thinkers, ancient and modern, to solve the physical problems of the universe, and shows how most of them failed, owing to neglect of observation and experiment, which we now know to be the most essential means of discovering physical truth. He points out, however, that before the appearance of Bacon's works the right method had come into use, and Copernicus, Kepler, Galileo, and others had made important discoveries by the use of it. Hence Bacon cannot be credited with discovering the new method, but only with being the first to generalize it and give a philosophical theory of it. He shows, as others have done, that Bacon recognized more or less clearly the various experimental methods now acknowledged by logicians, while at the same time he pointed out the defects in the induction of the ancients. Bacon also made a survey and classification of the sciences, which has not even yet lost all its interest, and which at the time it was written was quite remarkable. Bacon must also be credited, notwithstanding the defects in his moral character, with an earnest desire to serve his fellow-men, "believing," as he says of himself, "that I was born for the service of mankind." Such being his merits and such his purposes, it is important to inquire why it was that his own attempts to discover the secrets of nature resulted in nothing but failure. Professor Nichol discusses this question at considerable length, and expresses the opinion that Bacon failed partly because he had too overweening a sense of the power of his method, and partly because he thought the universe a far simpler thing than it really is; and he quotes Bacon's own remark, that he "should presently disclose and bring into sight all that is most hidden and secret in the world," as showing what extravagant expectations he had. But the main reason for Bacon's failure was that in his own researches he was seeking for something that does not exist. His object was to find the "forms" of things, and there has been some difficulty in ascertaining what he meant by this term. He certainly did not mean causes, and the true view is doubtless that expressed by Mill in his "Logic," and adopted by Professor Nichol. The "forms" were something "related to permanent qualities as efficient causes are to changes or events." Or, as Mill says, Bacon "seems to have thought, that, as every event has an invariable antecedent, so every property of an object has an invariable co-existent, which he called its form." But, as both Mill and Professor Nichol remark, there is no such invariable co-existent of each property of a thing; and hence Bacon, in his search after "forms," was pursuing *ignes fatui* with the usual result of landing in a bog. The failure of his own researches, however, should not blind us to his real contribu-

tions to the theory of method; and what these contributions were Professor Nichol has pointed out in the pages of this interesting work.

*Curve Pictures of London for the Social Reformer.* By ALEX. B. MACDOWALL, M.A. London, Sampson Low. 16°.

THIS little book is intended by its author to represent, in a pictorial form, such statistics and other information as are necessary for the social reformer in his efforts to deal with the great problems which he has undertaken to help to solve. Like the leader of an army setting out on a campaign, those who are bent on doing something to right the wrongness of our social state (especially through legislation) should see clearly what *is*, while cherishing an ideal to be realized. To furnish such a guide has been the author's endeavor. Diagrams are given by which one can ascertain for a series of years the following: population; density of population; birth, marriage, and death rates; early marriages; death by disease; suicides; drunkenness; felonies; licensed houses; apprehension; pauperism; education; illiteracy; prices of commodities and prices of meat.

*Marriage and Divorce in the United States.* By D. CONVERS. Philadelphia, Lippincott. 16°. \$1.25.

THE author of this work is a clergyman, and writes from a high-church point of view. He starts out with the remark that "marriage and divorce in the United States are in an unsatisfactory condition," and then goes on to criticise our marriage laws in detail. He calls attention to the looseness of these laws in some of the States, and to the difficulties often arising from the difference in legal requirements in different States. He strongly condemns the common-law doctrine of marriage, according to which all that is necessary to constitute a valid marriage is a mutual declaration by the two contracting parties that they take each other as husband and wife, followed by cohabitation; although he is obliged to admit that this is and always has been the canon law of the Christian church. He condemns marriage with a deceased wife's sister, which he declares to be incest. On the subject of divorce he takes the extreme scriptural ground, holding to the principle "once married, married till death." He would allow separation in case of fornication, but without liberty to marry again; while absolute divorce, such as the law now grants, he considers an abomination. He gives some tables and charts showing the rates of marriage and divorce in the different States of the Union, which will be useful to students of the subject, and also many interesting examples to illustrate the defects and inconsistencies in our marriage laws. The fault of his work is, of course, the extreme view he takes of the indissolubility of the marriage tie, — a view which the mass of men will not accept, and which it is impossible to embody in legislation. Our marriage and divorce laws need reforming, but the work must be done in a sensible and practical way, and not in a spirit of hide-bound conservatism.

#### AMONG THE PUBLISHERS.

IN the *Fortnightly Review* for April (New York, Leonard Scott Publication Company, 29 Park Row), Sir Charles Dilke presents the second of his series on the frontiers of India. These papers, while partly military, are largely made up of descriptions of places seldom visited by Europeans. H. H. Johnston discusses the question "Are our Foreign Missions a Success?" from the point of view of the political economist, and finds their indirect influence in matters of education and enlightenment of positive value. W. M. Gattis tells of some scandals of the English lighthouse boards, Professor J. R. Seeley's address on ethics and religion before the Ethical Society of Cambridge is printed in full. Arsene Houssaye, probably the only living survivor of the poet's friends, contributes the first section of a delightfully gossiping paper on Alfred de Musset. Mr. W. H. Mallock joins the agnostic controversy with a paper entitled "Cowardly Agnosticism," in which he points out a number of startling facts. Two papers from opposite standpoints treat of the enfranchisement of women, by Miss Fawcett and Stuart Glennie, which are especially timely in view of the fact that two bills are now before Parliament giving the suffrage to women.

Professor Dowden writes a scholarly and instructive paper on Edmond Scherer, the French poet and critic, who died in March.

—We regret to note that failing mental faculties have at last compelled Mr. George Bancroft, the historian, to abandon his literary labors.

—It is almost a year since *Scribner's Magazine* began the publication of its Railway Series; and the publishers now announce that in the June number they will begin a series of popular articles on the practical applications of electricity. Among the writers who have been already secured are Professor Cyrus F. Brackett of

Princeton College, who will write a general introduction to the series; Charles L. Buckingham, chief electrical engineer of the Western Union Telegraph Company; President Henry Morton of Stevens Institute of Technology; A. E. Kennelly, chief electrical expert of Mr. Edison's laboratory; Dr. M. Allen Starr, a medical investigator of high position; Lieut. W. S. Hughes of the United States Navy; and Lieut. John Millis of the United States Army. Among the subjects of the articles will be "The Application of Electricity to Modern Telegraphy, to Lighting, to the Household, to the Human Body, to Warfare on Land and Sea, and to Large Industries." The whole series will be illustrated.

Publications received at Editor's Office,  
April 8-13.

- ALDEN's Manifold Cyclopedia of Knowledge and Language. Vol. XII. Dominis to Electric Clock. New York, J. B. Alden. 12°. 50 cents.
- AMERICAN Workman, The. Vol. I. No. 1. New York, O. M. Dunham. 16 p. 4°. \$2.50 per year.
- ANDREWS, Thomas, the Scientific Papers of the Late; with a Memoir by P. G. Tait and A. Crum Brown. London and New York, Macmillan. 514 p. 8°. \$5.
- BENNETT, A. W., and MURRAY, G. A Handbook of Cryptogamic Botany. London and New York, Longmans, Green, & Co. 473 p. 12°. \$5.
- CHORAL Book, The, for Home, School, and Church. Tr. by Friedrich Zuchtman and Edwin L. Kirtland. Boston. Ginn. 95 p. 8°. 70 cents.
- DEIGHTON, K. Shakespeare's The Winter's Tale. London and New York, Macmillan. 198 p. 60 cents.
- DUPUIS, N. F. Elementary Synthetic Geometry of the Point, Line, and Circle in the Plane. London and New York, Macmillan. 294 p. 16°. \$1.10.
- GRAVER and Palette. Vol. 1. No. 1. New York, Graver & Palette Publ. Co. 8 p. f°. 50 cents per year.
- HAMILTON, D. J. A Text-Book of Pathology, Systematic and Practical. London and New York, Macmillan. 736 p. 8°. \$6.25.
- HOME Gymnastics for the Well and the Sick. Ed. by E. Angerstein, M.D., and G. Eckler. Tr. from 8th German ed. Boston and New York, Houghton, Mifflin, & Co. 94 p. 8°. \$1.50.
- HOMER's Odyssey. Books I-IV. Ed. by B. Perrin. Boston, Ginn. 229 p. 12°. \$1.50.
- JERRAM, C. S. Grace Reddenda. Oxford, Clarendon Pr. 100 p. 16°. (New York, Macmillan. 60 cents.)
- LEFFMANN, H., and BEAM, W. Examination of Water for Sanitary and Technical Purposes. Philadelphia, Blakiston. 106 p. \$1.25.
- LONGMANS' New Atlas, Political and Physical. Ed. by Geo. G. Chisholm. London and New York, Longmans, Green, & Co. 4°. \$4.
- MAC DOWALL, A. B. Curve Pictures of London for the Social Reformer. London, Sampson Low. 49 p. 16°.
- MACKNIGHT, J. A. Hagar. New York, Chicago, and San Francisco, Belford, Clarke, & Co. 321 p. 16°.
- OIL and Gas, the Journal of. Vol. I. No. 1. Fremont, O., H. E. Woods. 8 p. f°. \$2 per year.
- PROCTOR, R. A. The Student's Atlas. In Twelve Circular Maps. London and New York, Longmans, Green, & Co. 23 p. 8°. \$1.50.
- RAIN-Fall, Report of, in Washington Territory, Oregon, California, etc., for from Two to Forty Years. Washington, Government. 101 p. 8°.
- SCOTT's Rokeby: A Poem in Six Cantos. Ed. by Michael Macmillan. London and New York, Macmillan. 280 p. 16°. 90 cents.
- SMITH, R. H. Graphics; or, The Art of Calculation by drawing Lines, applied especially to Mechanical Engineering. With an Atlas of Diagrams. Part I. London and New York, Longmans, Green, & Co. 8°. \$5.
- STEELE, J. D. Hygienic Physiology with Special Reference to the Use of Alcoholic Drinks and Narcotics. New York and Chicago, A. S. Barnes & Co. 401 p. 12°. \$1.

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**PRINCIPLES OF EMPIRICAL OR INDUCTIVE LOGIC.** By John Venn, Sc.D., F.R.S., Fellow and Lecturer in the Moral Sciences, Gonville and Caius College, Cambridge. Author of "The Logic of Chance," "Symbolic Logic," &c. 8vo, \$4.50.

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# SCRIBNER'S MAGAZINE

FOR MAY CONTAINS.

**THE LAND OF THE WINANISHE** is the first of the FISHING ARTICLES, which will be followed by papers on STRIPED BASS AND TARPON fishing. Dr. Leroy M. Yale and J. G. Aylwin Creighton write of the Lake St. John Region north of Quebec, Canada, where the land-locked salmon is abundant. Superbly illustrated.

**THE FREIGHT-CAR SERVICE**, by Mr. Theodore Voorhees, describes the manifold system which keeps it in motion. With many interesting illustrations.

**PHOTOGRAPHY.** An absorbingly interesting article on the wonders of photography, by Prof. John Trowbridge. A list of the illustrations indicates the value of the paper:

<ul style="list-style-type: none"> <li>Photograph of candle taken by its own light.</li> <li>by lamp light, 20 seconds exposure.</li> <li>of an unstained plate.</li> <li>of same showing values of colors.</li> <li>of burning building taken by its own light.</li> <li>of surf higher than house.</li> <li>of human eye, contracted pupil.</li> <li>of human eye, dilated pupil.</li> </ul>	<ul style="list-style-type: none"> <li>Photograph taken through pin hole.</li> <li>of same through a \$50 lens.</li> <li>of maple tree showing colors.</li> <li>of a flash of lightning.</li> <li>of successive attitudes of a man throwing a stone.</li> <li>of frog taken under water.</li> <li>of human speech.</li> <li>of surf at Hastings, England.</li> </ul>
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**TOLSTOY 20 YEARS AGO.** Mr. Eugene Schuyler gives in this paper, which will be continued next month, his personal reminiscences of Tolstoy, with many conversations now first published. Illustrated by many interesting portraits.

**SHORT STORIES AND PAPERS** include "The Dilemma of Sir Guy the Neuter," by Octave Thanet; the second and concluding part of "Jeanne," by J. E. Curran; "Fiction as a Literary Form," by Hamilton W. Mable; and a new chapter of Robert Louis Stevenson's stirring serial "The Master of Ballantrae."

**THE LACK OF OLD HOMES** in America, by Charles Eliot Norton, forms a charming end paper this month.

**25 Cents a Number; \$3.00 a Year.**

**CHARLES SCRIBNER'S SONS, NEW YORK.**

— 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 Strasbourg, 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. Phye'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 arrangement 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 Winanish," 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