an ordinary hot air furnace for the purpose of concentrating a given amount of heat and conducting it through an interior pipe much smaller than the regular heating flue of the furnace, thereby heating the air more thoroughly in the regular furnace flue than is usual. This interior pipe is supported by radial projections in the regular flue. The method of superheating a portion of the air is to attach to the exterior of the fire chamber of the furnace a metal box, one side of which is open and is held in contact with the circular form of the fire chamber and is open at the bottom. From the top runs the conducting pipe, which carries the heat to the main flue. It appears to be a very effective appliance for heating horizontally inclined flues.

APPARATUS FOR PRODUCING ACETYLENE GAS.—THOMAS HOLLIDAY, Huddersfield, Eng. This apparatus is constructed to permit the use of the gas directly from the generator, the surplus pressure being compensated for by the weight of water in adjoining compartments. The gas holder is surmounted by a cistern of water in which is a worm pipe through which the generated gas discharges and which serves also to cool the gas. On a level with the gas holder, attached to its exterior, is a separate generator, in which is placed the basket of carbide. Extending upward from the bottom of the gas holder is a pipe communicating with the water cistern above. As the water flows from the cistern into the gas holder and fills the latter so that it overflows at the top into a pipe leading to the bottom of carbide receptacle, gas is at once generated. An excess of back pressure forces the water out of the gas holder into the cistern above. Suitable valves are provided at the bottom of the generator and gas holder for drainage and a clamped cover is upon the generator, permitting quickly the replacing of fresh for the used-up carbide.

MILL FOR CUTTING TEA.—CHARLES HENRY BARTLETT, Bristol, Eng. This invention relates to mills for cutting tea, and consists essentially of a revolving cylinder presenting cutting edges acting in conjunction with the stationary knife. The invention has for its object to avoid injury to the cutting edges of the cylinder and the knife, which is frequently caused by nails and other foreign substances in the tea. By means of a spring actuated detent, the knife is normally retained in an operative position, but it is free to yield to an excess of pressure. Friction gear comes into operation after the detent has yielded, allowing the knife to recede, the friction gear continues the motion until the knife blade is returned to operative position, the obstruction being meanwhile carried around and out by the cylinder, so that the cutting edges are not injured.

NOTE.—Copies of any of these patents will be furnished by Munn & Co. for 10 cents each. Please send the name of the patentee, title of the invention, and date of this paper.

NEW BOOKS, ETC.

SAJOUS' ANNUAL AND ANALYTICAL CYCLOPEDIA OF PRACTICAL MEDICINE. Vol. I. "Abdominal Injuries" to "Bright's Disease." Philadelphia: The F. A. Davis Company. 1898. Pp. 602. Cloth. 8vo. Price $5.

This is the initial volume of a work calculated to afford material aid to the general practitioner, the teacher and the student: first, by abbreviating the time and labor that has heretofore been demanded in order to critically review any medical topic; second, to obviate the necessity for accumulating a large, constantly increasing and expensive library devoted to special or exclusive subjects; third, to record every detail of progress during the previous decade, up to and including the current year; fourth, to lay the same, in connection with the negative and positive evidence, so concisely before the reader that he may at once grasp and solve a given problem with a minimum expenditure of effort; fifth, to do away with expensive medical indexes and index catalogues. Finally, the work is provided with a supplement in the form of a "Monthly Cyclopedia" that, arranged alphabetically, keeps each subject fully up to date; this monthly is a part of the cyclopedia and is a complete digest of current medical literature as well. All told, the cyclopedia will consist of six volumes, and three volumes of supplement, and will be completed early in 1900. The illustrations are of a class rarely seen in medical works, being models of clearness, exactness, and of the engraver's and lithographer's art. The editor, Dr. Charles E. De M. Sajous, and his large staff of expert associates, are to be congratulated upon the completeness, thoroughness, and eminently practical character of this work. The volume, moreover, is attractively bound and well printed.

HEAT EFFICIENCY OF STEAM BOILERS, LAND, MARINE, AND LOCOMOTIVE. With Tests and Experiments of Different Types, Heating Values of Flues, Analyses of Gases, Evaporation, and Suggestions for Testing Boilers. By Bryan Donkin. London: C. Griffin & Company, Limited. Philadelphia: J. B. Lippincott Company. 1898. 8vo. Pp. 311, 149 illustrations, tables, plates. Price $8.

The present work is a very valuable one. It is a book which no steam engineer can do without. It is filled with tables of the most valuable kind, embracing hundreds of tests by an engineer of high standing. The author has conducted many boiler tests and has collated and compared a large number of reliable tests by others, so that the principles governing combustion and efficiency in different types of boilers can be determined. The author has also added important chapters on combustion and kindred subjects. An excellent bibliography accompanies the work.

THE PHYSICAL GEOGRAPHY OF NEW JERSEY. By Rollin P. Salisbury. With an Appendix, by C. C. Vermeule. Trenton, N. J. 1898. 8vo. Pp. 200. Plates and maps.

This forms Vol. IV. of the final report of the State geologist. Like the preceding volumes, it is an important contribution to our knowledge of this State, which has been surveyed in a remarkably thorough manner. The volume will prove of great value to those who are in any way interested in geology or the State of New Jersey.

L'UTILIZZAZIONE DELLE FORZE IDRAULICHE E LA TRAZIONE ELECTRICA SULLE FERROVIE. By Marchese Achille Afan de Rivera. From the Nuova Antologia, July 16, 1898. Roma. 1898. Pp. 26.

NEUBAUTEN IN NORDAMERIKA. Berlin: Julius Becker, Friedrich-Strasse 240-241. 1898. Folio. 10 plates. Price $1.50.

This is a section of a work which will include 100 plates and which is certainly well calculated to give foreigners an idea of some of our architecture. The plates are beautifully executed and the subjects are well selected.

SUBMARINE TELEGRAPHS. THEIR HISTORY, CONSTRUCTION, AND WORKING. By Charles Bright, F.R.S.E. London: Crosby Lockwood & Company. 1898. 8vo. Pp. 743, xxxvi. 145 illustrations, plates. Price $25.

The present volume is based somewhat upon Wünschendorff's classic work, "Traité de Télégraphie Sous-Marine." Even a cursory examination shows that it is a book of great merit. A treatise on the subject has long been needed, and the book appears to admirably fill this somewhat neglected niche in electrical literature. It is surprisingly complete, and all phases of the subject, such as the history, construction, and working of submarine telegraphs, is adequately treated. For anyone who wishes a thoroughly up-to-date treatise on the subject, the book can be confidently recommended. It is profusely illustrated, and the work is published in a fine form.

MILITARY EUROPE. A NARRATIVE OF PERSONAL OBSERVATION AND PERSONAL EXPERIENCE. By Major-General Nelson A. Miles. New York: Doubleday & McClure Company. 1898. Pp. 112. 4to. Plates. Price $1.50.

There is no one better fitted to write upon military Europe than General Miles, who is every inch a soldier and to whom we owe much of our military success in our war with Spain. He writes interestingly about the "Turkish and Greek Armies," the "Military and Naval Glory of England as Seen at the Queen's Jubilee," and "Military Maneuvers." There is no doubt that General Miles obtained valuable information on his trip, and it is certain that many of the good features which European armies possess would be incorporated in our own if it were not for the evidently hopeless bureaucracy at Washington.

EXPLOSIVE MATERIALS. The Phenomena and Theories of Explosion and the Classification, Constitution, and Preparation of Explosives. By Lieut. John P. Wisser, U.S.A. New York: Van Nostrand Company. 1898. Pp. 160. 16mo. Price 50 cents.

The author is an instructor in the United States Artillery School and is editor of the Journal of United States Artillery. The book gives much valuable information in regard to explosives in very condensed form.

SECOND ANNUAL REPORT OF THE COMMISSIONERS OF FISHERIES, GAME, AND FORESTS OF THE STATE OF NEW YORK. Albany. 1898. Pp. 521. 4to. Plates.

This is certainly among the finest, if not the finest publication ever issued by any State in the Union, and is a credit not only to the commissioners, but to the State as well. It shows exactly how reports should be issued. The day of dry and musty documents is certainly at an end. The volume is large, handsomely printed, freely illustrated with colored and half tone plates and is bound in rich Holliston cloth stamped in black. The subjects selected for illustration are eminently pictorial and are of the kind which will delight the hunter, the fisherman, and those who like to pass a few weeks in a mountain camp. Although a considerable part of the report is taken up with statements of accounts, reports, laws, etc., still there are chapters which are very interesting. It is surprising to see what a really valuable book can be made from materials which in other hands would have been served up in the familiar rusty black cover and which is so promptly consigned to the waste basket.

PROCEEDINGS AND PAPERS OF THE NATIONAL FISHERY CONGRESS HELD AT TAMPA, FLA., JANUARY 19 to 24, 1898. Washington: United States Commission of Fish and Fisheries. 1898. Pp. 375. 4to.

This is an important collection of scientific papers presented at the congress, and the commission has undertaken the publication of the papers and an abstract of the proceedings.

A DETERMINATION OF THE RATIO (x) OF THE SPECIFIC HEATS AT CONSTANT PRESSURE AND AT CONSTANT VOLUME FOR AIR, OXYGEN, CARBON-DIOXIDE, AND HYDROGEN. By O. Lummer and E. Pringsheim. Washington: Published by the Smithsonian Institution. 1898. Pp. 29.

BULLETIN OF THE GEOLOGICAL INSTITUTION OF THE UNIVERSITY OF UPSALA. Edited by Hj. Sjorgren. Vol. III., 1896–1897. Upsala. 1898. Pp. 457.

The Process Year Book for 1898, published in England by Penrose & Company, which we have already reviewed, is sold in this country by G. Gennert, 24 and 26 East 10th Street, New York city. He is the American agent for this beautiful publication.

"Art Education" is a new publication devoted to art interests. It is issued by the J. C. Witter Company, 76 Fifth Avenue, New York city. This is a sumptuous quarto filled with excellent half tones and line engravings. It seems to admirably fill a much neglected niche in American journalism.

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The charge for insertion under this head is One Dollar a line for each insertion; about eight words to a line. Advertisements must be received at publication office as early as Thursday morning to appear in the following week's issue.

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Notes & Queries

HINTS TO CORRESPONDENTS.

Names and Address must accompany all letters or no attention will be paid thereto. This is for our information and not for publication.
References to former articles or answers should give date of paper and page or number of question.
Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all either by letter or in this department, each must take his turn.
Buyers wishing to purchase any article not advertised in our columns will be furnished with addresses of houses manufacturing or carrying the same.
Special Written Information on matters of personal rather than general interest cannot be expected without remuneration.
Scientific American Supplements referred to may be had at the office. Price 10 cents each.
Books referred to promptly supplied on receipt of price.
Minerals sent for examination should be distinctly marked or labeled.

(7491) J. A. A. wants to know (1) the process of mending negatives, that is, where holes are made in the film by scratching, or the film began to frill so the emulsion got soft and bare spots were made. How can these be filled up? A. Use Gihon's opaque and a pencil camel's hair brush. See also SCIENTIFIC AMERICAN SUPPLEMENT, No. 658. 2. Describe the process of solandi printing as used by botanists. A. We suppose it is like the blue print process, using a natural leaf in place of a negative. 3. What would be the proper size of a camera for amateur use and what style of lens would you recommend.? A. A 4×5 hand camera with an astigmat or rapid symmetrical lens. 4. Please tell me how to make flash light cartridges? A. See formula in SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 1062 and 1080.

(7492) A. I. B. says: Will you do me the kindness to explain the following statement appearing on page 531 (fourth line from top of page) of the seventeenth edition of "Experimental Science," by George M. Hopkins, and published by you: "Where several lamps are connected in series and the series are connected in parallel, if one lamp of a series should fail, the other lamps of the series would be useless without some device for automatically throwing into the circuit a resistance equivalent to that of a lamp, thus maintaining the same resistance in the circuit." What I wish to know particularly is what is meant by "some device for automatically," etc. A. When electric lamps are used in series, should one of the series be extinguished, the whole of that series would go out, because of the broken circuit. To prevent the rest from going out, there is attached to the lamp an automatic device which cuts in a circuit for the current around this lamp and the current is not cut off from the series. The rest of the lamps continue to burn. This circuit around the broken lamp must have a resistance equal to that of the lamp, in order to keep the current in the series the same as before.

(7493) J. A. R. says: Can you describe the process of working carbon in making one of the elements of an electric battery cell? I wish to construct a cell of battery of my own design which will require a carbon plate of peculiar shape which cannot be supplied by electric supply houses here; so I have decided to make one, provided the process is not too difficult an undertaking. Can you give general information which will be of use to me? I thought probably carbon could be obtained in crude form, which, after undergoing a process of pulverizing and pasting together, could be made to conform to the shape required. A. Carbon plates and rods are made from pulverized coke and lampblack, mixed with gas tar or asphalt and a cheap molasses. This is pressed in moulds by hydraulic pressure, and heated in an oven to decompose the carbonaceous materials and drive off the gases. This is often repeated several times, dipping the carbons in sirup between the heatings. One formula given is:

Powdered coke	15 parts.
Calcined lamp black	5 "
Special sirup	8 "

Mix with water and mould.

The answer to query No. 7475, by some means, was printed with a slight error in it. The last sentence should read: The square root of this result is the lifting power in pounds. The formula as given in algebraic symbols is correct.

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SEPTEMBER 6, 1898,

AND EACH BEARING THAT DATE.

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