NEW BOOKS AND PUBLICATIONS.

REPORT OF THE BOARD OF COMMISSIONERS OF THE GEOLOGICAL SURVEY OF PENNSYLVANIA TO THE LEGISLATURE, JANUARY 1, 1887. Pamphlet. Pp. 6.

This is a report of progress. It is preceded by two charts showing what part of the State has been mapped and reported on. The text particularizes the work of the past years, and states what remains to be done. A final clause recommends an appropriation of $90,000 to carry on the work of the survey.

NINTH ANNUAL REPORT OF THE CONNECTICUT BOARD OF HEALTH, FOR THE YEAR ENDING NOVEMBER 1, 1886. New Haven. Pp. xi., 167.

In the ninth annual report of the Connecticut health authorities, we find in addition to the general reports a number of treatises on subjects of present and vital interest. A report gives the health of towns, the character of each town being reported by a special observer, in many cases physicians. This gives an admirable diagnosis of the village sanitary aspect, and upward of 70 pages are devoted to the summary. Malaria and its etiology are exhaustively treated of by Dr. R. W. Griswold. This portion of the work is of interest to all, not being limited in its scope to the State. Pollution of Streams, by James B. Olcott, the Warming of Dwelling Houses, by Dr. G. Elliot, Analyses of Well Waters, an exhaustive series of papers on diphtheria and its causes, follow. Abstracts from Report on Adulteration of Foods, by Dr. A. J. Wolff, and a report on disinfectants end the main portion of the volume. The list of subjects shows how valuable the work is to sanitarians, and the book sustains the high reputation enjoyed by the Connecticut health reports during the past.

INDIANA: DEPARTMENT OF GEOLOGY AND NATURAL HISTORY. Fifteenth Annual Report. Maurice Thompson, State Geologist. 1886. Indianapolis. Pp. 359.

The annual report of the State Geologist of Indiana treats of the mineral resources of the State and of points in its geology, mineralogy, and flora. Prehistoric man is the subject of a monograph by S. S. Gorby. Natural gas and oil wells in the State are described by Maurice Thompson, who figures as the author of a great part of the volume. In testimonial of the good work done by these reports, the director states that he has answered over 1,500 letters from outside the State, touching on subjects of the survey in his charge. The paper by Professor Gorby on the anticlinal, termed by him the Wabash Arch, is of especial importance as touching the probabilities of a gas country being discovered. The work throughout bears a practical aspect, that will tend to make it of more immediate direct benefit than a purely theoretical work would be. It will attract attention from all interested in the mineral and mining development of Indiana. A glossary of scientific terms is a good feature not often found in this class of works.

ELEMENTARY TREATISE ON DETERMINANTS. By William G. Peck. New York and Chicago. 1887. A. S. Barnes & Co. Pp. 47. Price, 75 cents.

This little work treats in a very clear and intelligible style of the subject of determinants, now becoming an essential branch for those studying the higher mathematics. The general resolution of determinants is illustrated by algebraic and arithmetical examples—an excellent method in a text-book. The multiplication, squaring, and raising to higher powers of these functions is clearly explained, and in conclusion the differential of a determinant is treated of.

NATURAL LAW IN THE BUSINESS WORLD. By Henry Wood. Boston and New York. 1887. Lee & Shepard and Charles T. Dillingham. Pp. 222. Price, 75 cents.

This little work on political economy in its more practical field treats of the labor question, of poverty, and of the kindred topics occupying so much attention at the present day. The book is too concisely written to yield its spirit to a review. In the main a conservative spirit seems to guide the writer, and his treatment of the complex subjects to which the book is devoted will, we are sure, prove acceptable to many thinkers.

CURVE TRACING IN CARTESIAN CO-ORDINATES. By William Woolsey Johnson. John Wiley & Sons, New York.

GEONOMY: CREATION OF THE CONTINENTS BY THE OCEAN CURRENTS. By J. Stanley Grimes. J. B. Lippincott & Co., New York.

THE PEANUT PLANT: ITS CULTIVATION AND USES. By B. W. Jones. Orange Judd Company, New York.

THE TOBACCO REMEDY. By Gen. T. L. Clingman. Orange Judd Company, New York.

* * Any of the above books may be purchased through this office. Send for new catalogue just published. Address Munn & Co., 361 Broadway, N. Y.

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.
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.

(1) G. H. D. N. asks the constituents of the usual common black varnish much used as a painting on iron vessels, etc. A. Boil coal tar until it shows a disposition to harden on cooling; this can be ascertained by rubbing a little on a piece of metal. Then add about 20 per cent of lump asphalt, stirring it with the boiling coal tar until all the lumps are melted when it is allowed to cool, and is kept for use. Asphaltum and gas tar are frequently sold one for the other. The source of supply is different, but they are very similar in their results.

(2) B. O. F. asks: What is the best or safest way of reducing flesh without material injury to the body? A. Reduce the quantity of your diet and increase your walks, say to nine miles daily.

(3) J. L. asks if hot water or steam will take the temper out of a spring. A. It is possible, and sometimes occurs. Springs in cylinders of engines working under high pressures sometimes lose their temper from long exposure to the heat.

(4) G. F. W. asks how to fasten wire to electric light carbons so that the wire will not corrode when the carbons are used in a sal ammoniac battery. A. Dip the upper ends of the carbons, if they are not coppered, into paraffine, then plate them in a sulphate of copper bath with copper, and solder your wires to the copper; or you may dip the coppered ends into melted type metal, and use a clamp to hold the wire. This is far the best method.

(5) T. H. asks: Is there any sure way of detecting sewer gas except by feeling its effects? A. No sure way is known. The most reliable would be a bacterial analysis of the suspected air. The reducing action of the air upon a solution of permanganate of potash also gives a possible clew for solving the problem. Instead of testing directly for the gas, the usual practice is to examine the pipes for leakages at the joints, or for defective seals, by pouring oil of peppermint and hot water into the pipes and then tracing leaks by the odor. The oil should, if possible, be introduced from the outside and by another person. Experience is necessary to conduct the test properly.

(6) E. M. asks for a good work on dry plate emulsions. See "Photography with Emulsions," $1.00, by Captain Abney, and "Dry Plate Making for Amateurs," 50 cents, which we will mail on receipt of price. Also see SCIENTIFIC AMERICAN SUPPLEMENT, No. 541.

(7) H. E. B. asks: 1. If I take a Leyden jar and charge it with electricity, and then slip another jar not charged inside of the first jar, and connect the inside of the inner jar with the earth, will the second jar become charged? A. The inner jar will become charged. 2. Why cannot any one charge a Leyden jar by connecting the inside of the jar with the positive pole and the outside with the negative pole, and not depend on induction for charging one side of the jar? A. The jar can be so charged, and the Holtz machine is very conveniently used in this way to charge jars. 3. What is a cascade in electrical parlance? A. A cascade of Leyden jars indicates their arrangement in series, the inner coating of one communicating with the outside of the other; during the charging process, the jar at one end has one coating, generally the inner, connected with the machine, while the opposite coating of the last jar is grounded. The arrangement gives a very high tension spark. 4. Is there any element that is as strongly diamagnetic as iron is magnetic? I have been told that bismuth, when suspended between the poles of a magnet, tends to arrange itself transversely to the poles of the magnet, and with nearly as much power as iron would tend to arrange itself from pole to pole. Is this true? A. No such element is known; the phenomena of diamagnetism are far weaker in degree than the direct magnetic action (paramagnetic) of a magnet upon iron.

(8) G. F. asks some common sense arrangement for regulating an incubator to keep it any desired temperature, say 103° Fah. A. There is a variety of ways for regulating incubators, many of which are patented. The most simple one, and easiest made by an amateur, is to fasten a strip of hoop iron about one inch wide to a similar strip of sheet zinc of same size, by lightly riveting or only winding with twine. Rivet or solder the ends together solid, or so they cannot slide upon each other. Make the strips somewhat shorter than the distance across the hatching box. Fasten one end at one end of the box near the top, leaving the other end free to move. The changes of temperature will swing the free end to and fro for a short distance, and this can be made to move a delicately hung ventilating shutter or vary the height of the wick in the lamp as desired. If you are ingenious, we think you can figure out the detail yourself.

(9) L. M. asks: How many and what kinds of lenses would be required to make a first class magic lantern, and can as good results be got with polyopticon as with magic lantern? A. For a first class lantern use achromatic lenses, plano-convex, 1¼ to 2 inches diameter and from 8 to 16 inches focal length, according to sizes of pictures to be shown and distance of screen. Also plano-convex condensers, 3 inches to 4 inches diameter, 8 inches to 12 inches focus, placed convex sides together. You may use the same size and focus single plano-convex lenses for a polyopticon, but it does not give as much satisfaction as a well equipped magic lantern.

(10) F. W. S. asks: If the pumps fail to work, the water is low, and you are in danger of being driven on a lee shore, what course would you adopt? and says the question was asked an engineer trying to take out papers in a Western city. A. Such a question can only be answered circumstantially. No sea or lake going steamer should be licensed with but a single means of feeding the boilers. A steam pump and an injector should be provided, as well as hand pump that can be used in case of necessity for the boilers and for clearing the vessel in case of leaks otherwise uncontrollable. When all supplementary means fail, steam until the water reaches the tubes or flues, then shut down, draw fires, and go ashore, if sails cannot save you.

(11) C. A. S. asks how to coat a number of small articles with bronze, by dipping. A. You may make a bronze dip by mixing bronze powder with thin varnish. Thin any ordinary varnish with turpentine, and keep it thoroughly stirred while dipping. A better and brighter bronzing is made by dipping in very thin varnish and allowing it to partially dry, then brushing the work with the dry powder on a fur brush.

(12) J. J. P. asks how gelatinized paper is prepared for performing the experiment of the paper mermaid, described on page 56 of the January 22, 1887, issue of the SCIENTIFIC AMERICAN. A. Dip a piece of tissue paper in a weak solution of gelatine and water, from 4 to 12 grs. to 4 oz. water. When dry, the paper will operate as described.

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AND EACH BEARING THAT DATE.

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