

SCIENTIFIC AND PRACTICAL INFORMATION.

CHOLESTERIN.

This curious organic substance was first obtained by Conradi in 1775, from the so-called bile stone. Its chemical composition is represented by the formula $C_{26}H_{44}O$. It is a white, tasteless, inodorous substance, insoluble in water, sparingly soluble in cold alcohol, but easily soluble in boiling alcohol which, on cooling, deposits beautiful crystalline nacreous laminae, soft to the touch and melting at 278° Fah. It is also soluble in ether, wood spirit, oil of turpentine, soap water, and neutral fats. A solution of cholesterolin, in two volumes of alcohol and one volume ether, deposits, by spontaneous evaporation, laminated transparent crystals of hydrate of cholesterolin ($C_{26}H_{44}O + H_2O$).

Cholesterolin resists the action of concentrated alkaline solutions at boiling heat, but lime decomposes it at 482° Fah.; hydrogen is given off and the cholesterolin converted into an amorphous fatty body, nearly insoluble in alcohol. When strong sulphuric acid is gradually added to a slightly heated mixture of cholesterolin and dilute sulphuric acid, it becomes soft, acquires a deep red color, and decomposes, giving off all its oxygen in the form of water.

Cholesterolin is converted by the action of nitric acid into cholesteric acid, $C_8H_{10}O_5$.

A biliary calculus, or bile stone, composed of nearly pure cholesterolin and beautifully crystallized, was recently found in the smaller intestines of Mr. V. M. Griswold, a well known photographic chemist of Peekskill, N. Y. At the time of his death, this obstruction had reached an enormous size, being an inch in its smallest diameter, two inches long and five inches in its longest circumference. Mr. Griswold had been confined to his bed but four days, and died in the greatest agony.

LEAD GLAZING IN STONE AND EARTHENWARE.

It is well known that a lead glaze has long been used as a glazing for pottery. The danger to which the workmen are subjected in its use ought, before this, to have consigned it to that limbo whence no lost art returns. The dust given off by grinding the lead oxide is breathed by the workman, is brought into contact with him as a slimy mass floating on water when he dips the pot in glazing, and he absorbs its vapors while the vessels are burning. Hence it is that potters and manufacturers of earthenware frequently suffer from lead colic, which often proves fatal. A glazing, free from lead, has been invented and used by Alois Klammerth, of Znaim, Moravia, Germany, which, it is hoped, will save the lives of hundreds of workmen now sacrificed on the leaden altar. His glaze consists of two thirds of fusible brick clay, and one third of a clay which contains a large quantity of ocher or iron ore, the whole mixed with 8 parts of ley from wood ashes. This glazing, although requiring a high temperature in the burning, is so firm as to resist the action of mineral fully as well as glass. The operation is very simple and the results so satisfactory, after a six years' trial, that the process may already be called success, and not only are users of the ware safe against the insidious and cumulative poison, but the workmen too are safe from all danger in its use.

A New Objection to Patent Laws.

It has been our lot from time to time to hear a great many objections, good, bad, and indifferent, against the existence of a patent law, but it could only have occurred to a Scotchman to start what we have lately become familiar with under other circumstances as "the religious difficulty." During the sittings of the late Parliamentary Committee on Patents, Mr. Macfie, the well known advocate for abolition of patent right, managed on every possible occasion to bore his colleagues on the committee, and to puzzle the witnesses by making a long speech embodying his particular views in the guise of a question. One of the persons under examination happened to use the word "steal" in reference to those persons who used an invention without paying royalty to the inventor. Mr. Macfie was down upon the unfortunate witness in the following manner (Question 2250): "You use the word 'steal,' but I think God, in His providential arrangements, has so constituted mankind that one receives the benefit of that which another discovers, and I think that the patent laws have a tendency to interfere with those divine arrangements; I look on the patent laws as facilitating a denial to the nation of that which in their absence they would enjoy; do you really think the word 'steal' appropriate?" We have ventured to italicise a portion of this extraordinary "question," which places the matter in an entirely new light. With the fear of Exeter Hall before our eyes, let us remove the foul blot from our statute book without a moment's delay.—*Engineering.*

High Heeled Boots for Ladies.

A London surgeon, Mr. P. Hewlett, reports several cases of serious fractures of limbs indirectly caused by these heels, which had tripped up their wearers; and he refers also to the distortion and injury to the foot that they often induce. He says: "Last year I was sent for to see a young lady in one of our London hotels. She wished to consult me about her foot. On seeing it I thought its state depended upon her boots, and I asked to see them. The boots were brought in by the lady's maid, but the only thing I could observe about them was the immensely high heels. I said: 'It is the high heels of your boots that cause the mischief, and unless you diminish them I can do nothing for you.' She became quite angry, and said she could not alter them. 'I cannot do it and will not.' Suddenly she again toned down, and said: 'Pray, sir, what would people say if they saw me walking about the park without high heels?' I said: 'It is simply

heels versus brains. If you have brains, you will cut off the heels; if you have no brains, you will continue to wear them.' She fortunately had brains, cut off the heels, and her foot got quite well."

GROWTH OF NAILS.—M. Dufour has made observations as to the rate of growth of the nails. Here are some of the results: The nails of the little fingers grow more slowly than those of the other fingers and the thumbs. The difference is about one ninth. The mean rate of these (excluding the little fingers) is about one millimeter (100th part of an inch) in ten days. The rate of growth on the thumbs is probably greater than that on the six longer fingers. There is little difference between the rates of growth in different animals. The nails grow at about the same rate on both hands. The rate of growth is not constant throughout the length of the nail; it is greater near the base. The rate of growth at the side parts is probably the same as in the middle part. The substance of the nail advances equally throughout its breadth. The rate of nail growth in an individual at intervals of several years shows sensible differences.

DEACON'S METHOD OF OBTAINING CHLORINE.—The process consists in passing a heated mixture of air and hydrochloric acid over sulphate of copper, or over pieces of pumice or brick saturated with the same. He finds that the action is essentially a surface action, and that there is a certain comparatively small range of temperature, between the critical limits of which the percentage of hydrochloric acid decomposed varies greatly. The velocity with which the mixed gases pass over the surface of the active material also causes considerable variation in the comparative amount of chlorine produced.

WE are asked by our correspondents for the addresses of makers of round leads for pencils and for a good book on the subject, for a good printing ink at 25 cents a pound, the price of a one horse power caloric engine, where to get a small brass engine of sufficient capacity to run a sewing machine or churn, and many other articles, for introducing which to the public our advertising columns are always open.

A NOVEL ESCAPE FROM PRISON.—A prisoner in the New York city prison, possessed of some medical knowledge, recently conceived the idea of producing artificial small pox for the purpose of being removed to Bellevue Hospital, where he would have a good chance for escape. He touched his face over in spots with croton oil, which quickly produced pustules. He was regarded as a small pox patient by Dr. Nealis, removed from prison and sent to the hospital, whence he duly made his escape. Four other persons confined in the prison then tried the same game, but were detected and remanded to their cells.

"LONGFELLOW," the fastest racing horse in America, was badly injured, during a race at Saratoga Springs, July 16th. One of his racing shoes became twisted and cut the adjoining foot and leg. It was a three mile race, with "Harry Bassett." Longfellow had made $2\frac{1}{2}$ miles in 3 min. and 59 sec.—the fastest time on record—when the accident occurred, and Bassett came in one length ahead.

A PATENT has lately been granted to B. F. Day, of Hazleton, Pa., for the separation of slate from coal by means of an ascending column of water. The lighter mineral is carried off by the water while the heavier, descends through the water. An apparatus working on this principle, for separating diamonds from other pebbles, has been in use for several years.

Business and Personal.

The Charge for Insertion under this head is One Dollar a Line. If the Notices exceed Four Lines, One Dollar and a Half per Line will be charged.

Dry Steam, dries green lumber in 2 days; tobacco, in 3 hours; and is the best House Furnace. H. G. Bulkley, Patentee, Cleveland, Ohio.

The paper that meets the eye of manufacturers throughout the United States—Boston Bulletin, \$4 00 a year. Advertisements 17c. a line.

Apple Grinders—The Best Machine can be had by addressing Watson Barr, Ypsilanti, Mich.

It is better to purchase one of the American Twist Drill Company's Celebrated Patent Emery Grinders than to wish you had.

Wanted—A situation as foreman of a boiler-shop—has had over twenty years' experience in the construction of locomotive, marine, and stationary boilers. Has been, until quite recently, foreman of the boiler-shops in a leading manufacturing establishment. Address "Boiler Maker," Rail Road Gazette, 72 Broadway, New York City.

Spring Bed, Bed Spring, Fanning Mill, and Thrashing Machine Manufacturers. Send circulars to H. Oxborn, Richmond, Ind.

Jewels for all secret societies, badges for all kinds of business, plated and lettered at wholesale prices. Die sinking, mould making. Send model or pencil sketch. Waterman & Co., Box 57, West Meriden, Ct.

Band Saw Mills.—I wish to communicate with parties engaged in the manufacture of Band Saw Mills for sawing lumber from the round log, also with parties who have such mills in successful operation. R. F. Learned, Natchez, Miss.

Blake's Belt Studs. The best fastening for Leather or Rubber Belts. 40,000 manufacturers use them. Greene, Tweed & Co., 18 Park Place, New York.

New Style Testing Machines—Patented Scales. Send for New Illustrated Catalogue. Riché Brothers, 9th and Coates Streets, Philadelphia, Pa.

Flouring Mill near St. Louis, Mo., for Sale. See back page.

Diamonds and Carbon turned and shaped for Philosophical and Mechanical purposes, also Glazier's Diamonds, manufactured and reset by J. Dickinson, 64 Nassau st., New York.

State Rights on improved Cigar Moulds for Sale. Patented June 26, 1872. Inquire of Isaac Guthman, Morrison, White Side Co., Ills.

For Machinists' Tools and Supplies of every description, address Kelly, Howell & Ludwig, 917 Market Street, Philadelphia, Pa.

A traveling agent throughout Germany, Austria, and Switzerland, offers his services. Address A. D. P., 71 Essex Street, New York.

The best recipes on all subjects in the National Recipe Book Post paid, \$2.00. Michigan Publishing Company, Battle Creek, Mich.

The official report of the Master Mechanics' Association will be published in full in the RAILROAD GAZETTE, 72 Broadway, New York, beginning July 6. Send \$1.00 for 3 months' subscription.

We will Remove and Prevent Scale in any Steam Boiler or make no Charge. Two Valuable Patents for Sale. Geo. W. Lord, Phila., Pa.

For Hydraulic Jacks and Presses, New or Second Hand, send for circular to E. Lyon, 470 Grand Street, New York.

Walrus Leather for Polishing Steel, Brass, and Plated Ware. Greene, Tweed & Co., 18 Park Place, New York.

For Marble Floor Tile, address G. Barney, Swanton, Vt.

Upright Drills—The best in the world. Built by Hawes Machine Co., Fall River, Mass. Send for Circular.

Steam Boiler and Pipe Covering—Economy, Safety, and Durability. Saves from ten to twenty per cent. Chalmers Spence Company, foot East 9th Street, New York—1202 N. 2d Street, St. Louis.

Three fourths saving of fuel, by the Ellis Vapor Engine (Bisulphide of Carbon) in running the Haskins Machine Co's Works, Fitchburg, Mass. To whom apply.

Old Furniture Factory for Sale. A. B., care Jones Scale Works, Binghamton, N. Y.

Peck's Patent Drop Press. For circulars address the sole manufacturers, Milo, Peck & Co., New Haven, Ct.

Steel Castings to pattern, strong and tough. Can be forged and tempered. Address Collins & Co., 212 Water Street, New York.

The Waters Perfect Steam Engine Governor is manufactured by the Haskins Machine Co., Fitchburg, Mass.

Presses, Dies, and Tanners' Tools. Conor & Mays, late Mays & Bliss, 4 to 8 Water st., opposite Fulton Ferry, Brooklyn, N. Y.

Portable Baths. Address Portable Bath Co., Sag Harbor, N. Y.

Brown's Coal-yard Quarry & Contractors' Apparatus for hoisting and conveying material by iron cable. W. B. Andrews & Bro. 114 Water st., N. Y.

Mining, Wrecking, Pumping, Drainage, or Irrigating Machinery, for sale or rent. See advertisement, Andrew's Patent, inside page.

All kinds of Presses and Dies. Bliss & Williams, successors to Mays & Bliss, 118 to 122 Plymouth St., Brooklyn. Send for Catalogue.

For Steam Fire Engines, address R. J. Gould, Newark, N. J.

In the Wakefield Earth Closet are combined Health, Cleanliness and Comfort. Send to 36 Dey St., New York, for descriptive pamphlet.

Williamson's Road Steamer and Steam Plow, with Rubber Tires. Address D. D. Williamson, 32 Broadway, N. Y., or Box 1809.

Belting as is Belting—Best Philadelphia Oak Tanned. C. W. Arny, 301 and 303 Cherry Street, Philadelphia, Pa.

Boynton's Lightning Saws. The genuine \$500 challenge. Will cut five times as fast as an ax. A 6 foot cross cut and buck saw, \$4. E. M. Boynton, 80 Beekman Street, New York, Sole Proprietor.

Better than the Best—Davis' Patent Recording Steam Gauge. Simple and Cheap. New York Steam Gauge Co., 46 Cortlandt St., N. Y.

For Solid Wrought-iron Beams, etc., see advertisement. Address Union Iron Mills, Pittsburgh, Pa., for lithograph, etc.

For hand fire engines, address Rumsey & Co., Seneca Falls, N. Y. To Ascertain where there will be a demand for new Machinery, mechanics, or manufacturers' supplies, see Manufacturing News of United States in Boston Commercial Bulletin. Terms \$4.00 a year.

Notes & Queries.

[We present herewith a series of inquiries embracing a variety of topics of greater or less general interest. The questions are simple, it is true, but we prefer to elicit practical answers from our readers.]

1.—HARDENING SOAP.—What is the best thing with which to harden soap?—D. D.

2.—TESTING BOILERS BY HYDRAULIC PRESSURE.—How can I apply hydraulic power as a test to a boiler, which is intended to carry 100 pounds of steam to the square inch?—F. M. C.

3.—REMOVING THE CRUST OF SHELLS.—Can any of your readers inform me how to remove the outside crust of sea shells so as to show the natural color of the shell?—R. J.

4.—SAND PUMPING.—In your article of July 13, referring to the East River bridge, you say sand was discharged at a depth of 60 feet (removed from the caisson) by means of the air system through a $3\frac{1}{2}$ inch pipe continuously. Will some one please explain the operation of the air system?—W. E. F.

5.—METAL DRILLING.—With what shaped point should small drills (from one thirty-second to one fourth of an inch) be made to make them cut the fastest and best, or to "take" into the metal most rapidly? I have an upright foot power drill, and usually the piece of iron to be drilled is the same thickness as the diameter of drill. Should they be made square and sharp pointed, or flat like a cold chisel or a common twist drill?—H. V.

6.—ELECTRICAL MACHINE.—Are there positive and negative poles to the induced current of an electrical machine such as is used by doctors? If there are, how can I tell which is which? Also, how must I make the coil so that, when the wire bolt is out entirely, I cannot feel any current?—R. P. P.

7.—PERMANENT MARKS IN ELECTRO-CHEMICAL TELEGRAPHY.—How can the marks on electro-chemical telegraph paper, which is moistened with solution of iodide of potassium, be made permanent and the paper be protected from the action of ozone which releases the iodine, coloring the paper and obliterating the marks? Should the liquid in which the paper is moistened be a saturated solution of iodide of potassium? The solution must be very sensitive to the passage of the current.—G. B. M.

8.—RHUMKORFF COIL.—I want to make a Rhumkorff coil that will give a three or four inch spark. I wish to know: 1st. The size, length and insulation of wire (iron or copper?) in primary coil, and whether it should be put on in one or more pieces. 2nd. Size and amount of wire (iron or copper?) in secondary circuit, and how insulated? 3d. The manner of constructing condenser, and how connected to the coil. 4th. What length shall I make it? I have made several small ones, but the effect is not proportionate to the amount of material used. So I want to proceed with the next one in a systematic way.—R. E.