

ON TRIAL!!! The new INDEPENDENT \$2.00 monthly, "THE SCIENCE OF HEALTH," sent three months for 25c. by S. R. WELLS, 889 Broadway, N. Y.

Facts for the Ladies.—Mrs. Thos. L. Smith, Wellsville, N. Y., has used her Wheeler & Wilson Lock-Stitch Machine eleven years, without any repairs, and one needle—No. 2—for nearly five years. See the new Improvements and Woods' Lock-Stitch Ripper.

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.—EXTRACTING SILVER FROM WASTE PRODUCTS.—I have a quantity of chloride of silver, containing also cream of tartar and common salt. How can I convert this into pure silver, or into the nitrate?—J. H. P.

2.—BLEACHING SHELLAC.—I am using shellac varnish for varnishing my negatives, but it gives them a color which I do not like. How can I remove the color, or bleach the shellac?—L. Q. B.

3.—DISSOLVING SHELLAC.—Is there any process by which shellac can be dissolved in water? Is there any way in which more than the usual amount may be dissolved in alcohol?—L. Q. B.

4.—PAINTING TIN ROOFS.—What paint is best for tin roofs? What time of the year is best to put it on? Should the old paint be removed before the new is applied? How long ought the best paint to last on a tin roof?—L. M.

5.—FREAKS OF BOILERS.—On August 16, 1871, we began to use a second hand boiler; in a few weeks, it began to leak, and the iron showed fine cracks. We had a patch put in, and it gave out in a few days. Then we put in a new sheet; it lasted a few days, bulged badly, and sprung a leak. Then we put in a new boiler, made of the same iron as the sheet put on the old boiler, and fired up at 6 o'clock A. M. At 3 P. M. two sheets bulged; we put in two new ones, and ten hours afterwards these were as bad. We then put in three new sheets; these ran for a few days and then gave out. A boiler inspector says that it was the fault of the fireman; can this be so?—G. & B.

6.—BURNING GAS.—I have an ordinary gas fixture burning 5 feet of gas per hour, and if I attach, by a piece of rubber tubing, an argand burner, I get more light. Can I possibly burn more gas per hour than I did before the argand was attached? It has been asserted that the argand greatly increases the draft and has the same effect as though the pressure was increased in the street mains. On the other hand, it is claimed that no more than 5 feet of gas can come through a 5-foot burner. How is it? Argand burners would be more frequently used but for the impression that they are very much more expensive.—M.

7.—HYDROGEN LAMP.—Your description of the hydrogen lamp will not, I fear, satisfy expectation. It requires refilling too often, and sulphuric acid is difficult to procure in country places. The commercial acid sold in the shops is valueless, as it acts but very feebly on zinc. I therefore propose, as a substitute for the hydrogen lamp, a battery and a platinum wire (if practicable) and I would like to ask if a platinum wire heated to whiteness by a battery will ignite an alcohol or kerosene lamp? What kind of battery would be most suitable and least expensive for this purpose?—J. H. P.

8.—EXHAUST STEAM IN A STEAM JACKET.—Some engine builders surround their cylinders with a chamber through which the exhaust steam is passed, imagining that such jacketing affords protection against loss of heat from the cylinder. I have long suspected that this was a mistake, and that the exhaust steam would carry away more heat than would be radiated from the naked cylinder, even in cold weather; but I am not in possession of any data from which I can estimate the extent of such loss, if any. Can you or any of your readers give me or refer me to any? Some builders take special pains to avoid all contact between the exhaust steam and the shell of the cylinder, while others, among whom are some prominent eastern builders, seem to be indifferent in the matter.—J. W. T.

9.—DIAMONDS IN NEW MEXICO AND ARIZONA.—Reports come to us daily of the discovery of diamonds in these territories, and as but little is known about them, will some one please give us information? 1st. What are the origin and formation of diamonds? 2nd. In what localities are they mostly found, high, low, or level, among rocks or gravel? 3rd. What is the best manner of determining or testing which are true diamonds in the rough? 4th. How is the value ascertained? 5th. What is the best manner of locating or taking up claims, as there seems to be no law relative to locating diamond mines in the United States? A large party of miners will go this fall from Elizabethtown, New Mexico, and they know but little of the mode of diamond mining or hunting, although they are well versed in regard to minerals in general.—H. M. P.

10.—BOILER SCALE.—I am running a boiler, 36½ feet long, 4½ feet diameter, with five flues, three of 11 inches, and two of 14 inches. The flues prevent my cleaning it from the inside. There is a hand hole at each end of the boiler, likewise a man hole. The boiler in question has been running three months, the water used is brackish, and has a muddy appearance. In cleaning our well, we get nothing but white sand. The scale or deposit in the boiler is nearly three thirty-seconds of an inch in thickness. I have tried the much talked of anti-incrustators, but without effect. I have also tried potatoes; I put in half a bushel, but perhaps that was not enough. A couple of weeks since, I took out several pieces of this deposit; one piece I put intopure, another in diluted, sulphuric acid. After standing 6 hours they remained undissolved. I had thought before this trial that the scale was lime and salt, but find now that it is nothing but white sand along with a small quantity of clay. I have tried to settle the water, but after standing a couple of weeks, it presents the same muddy appearance; but no matter how cloudy it is, if the rain beats into the tank for but one hour, it will, in a few hours, be so clear that the bottom of the tank can be seen. Now what acts so magically upon this water? Is it not the ammonia in the rain water? If so, cannot I settle it by using ammonia or alum? and how much is necessary for a 60 barrel tank? We removed a locomotive boiler about three months since; the deposit on the sides of the fire box was one fourth inch thick. I wish to find something to suit my case. Every day the boiler gives more trouble in raising steam, and I know the time will come when it will be almost impossible to keep up steam. I know there are many others in a like situation, and if you could give us any advice it would be thankfully received.—E.

11.—CEMENTED FLOORS.—A few months ago I cemented the bottom of my cellar, which had always been dry, clean, and noted for keeping every thing put into it in a satisfactory condition. Now it is all changed. Moisture gathers and remains on the cemented bottom, the whole cellar is damp, moldy, and unwholesome, and nothing will keep. The ventilation is the same as before the bottom was cemented, namely, by windows. It has been suggested that I cement the side walls, which are of limestone laid in ordinary mortar, to keep out the moisture which perhaps was formerly absorbed by the earth floor or bottom. What do you think will be the proper remedy?—J. C. W.

12.—CONSTRUCTION OF LIFE BOATS.—Concerning the necessary points essential in constructing a life boat, let me ask, as nearly all the accidents occur upon steamship routes, or routes frequently travelled: If passengers can only be kept safely afloat until a passing boat picks them up, is it necessarily essential that a mode of propulsion be attached to a boat? Judging from the difficulty of keeping a life boat headed to windward, will a life boat left to follow its own motion lie lengthways in the roughs of the waves, and duly assume another position when guided by the

rudder? Could not a lifeboat, upon a plan allowing the necessary amount of provisions and water, means of signaling, etc., easily launched, capable of riding the waves in the severest storm without fear of capsizing or swamping until succor comes to the passengers from passing boats, be built? I am at present engaged on the plans of a life boat possessing these merits, and I desire to hear some opinions on the subject before completing them.—L. S. F.

13.—RHEOSTAT.—I wish to construct a rheostat or resistance indicator to be used in connection with a galvanometer for testing telegraph lines. Will some one who has a good one please describe it so that any good mechanic can construct one like it? I wish to know what alloys are generally used for the resistances, and in what form. Is it a very fine wire, insulated with cotton or silk, and wound in a coil with the resistances measured off and a switch between each so as to make the combination? What length of wire of some particular number and composition has 10 ohms resistance? I cannot find any details in any text book to which I have referred.—S. C. D.

14.—DISSOLVING GLASS.—Will some of your readers give directions for dissolving glass so that it can be used with a paint brush, and tell me how it should be done so as to retain its original gloss? Can coloring matter be used with it?—D. R.

15.—EXTERMINATING SNAILS.—What is the best method of destroying and preventing snails in wells?—J. A. D.

16.—WATERPROOFING LEATHER.—How can I make thin calfskin leather waterproof?—F. C.

Answers to Correspondents.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries however, when paid for as advertisements at \$1.00 a line, under the head of "Business and Personal." ALL reference to back numbers must be by volume and page.

CAR FARE BOXES.—C. H. R.'s suggested improvement is already in use.

PACKING AND BLACK POLISH.—E. should consult our advertising columns.

D. F. McE.—We are indebted to this correspondent for a very fine insect specimen. He desires to know what it is. Answer: It is the *dynastes tityrus* of entomologists, one of the largest beetles within the United States. It belongs to the same family as the sacred *scarabæus* of the old Egyptians.

C. W. P., of Dakota, writes: Enclosed please find a number of different kinds of rock, found near Sioux Falls, Dakota Territory. Please inform me if they are of any value. Answer: The specimens are quartz, except the yellow one, which is chalcedony; neither is of any value.

J. N., of Texas, writes: Will you please inform me what kind of ore is the enclosed? We have an abundance of it in our neighborhood. Answer: It is the red hematite ore of iron, which often occurs in concentric layers. It is a very rich ore.

H. A. S., of Me., writes: Please find a solid substance enclosed which a lady found in an egg. I presume it is a piece of coagulated albumen, but I cannot imagine how a portion of the albumen should become coagulated in a fresh raw egg. Can you? Answer: The specimens are condensed portions of the yoke, not "coagulated albumen." We have a similar example on a larger scale in our possession. They consist mainly of globules of oil.

G. W. G., of Ill., writes: Enclosed you will find a mineral specimen found on a relative's farm near Galena. I request you to inform me what it is. It is found in a meadow (lowland) with a spring close by; what quantity there is, I cannot tell. We have had a bucketful tried in the stove and it seems to burn well, but I am at a loss to say what it is. Answer: It is asphaltum, resembling the celebrated deposits in New Brunswick and Trinidad. If abundant, it is valuable.

R. & T., of Georgia, write: We here hand you a sample of what we term, for want of a better name, a mineral polish in its crude state. We have tested it as a polish upon steel, brass, etc., with results highly satisfactory to us. We have burned it, and find that it stands the strongest fire test we can apply without being affected in the least. Answer: The specimen consists mainly of quartz in a finely comminuted state. It differs from tripoli in not being of animal origin. It has probably resulted from disintegration of some granitic rock. It is softer than emery, but for many purposes it would make an excellent polish.

J. L. S. says: On page 160 of your current volume, in an article on writing fluids, you mention the use of chromate of potash (not bichromate). I am a maker of ink, and I want to make an experiment, and I can find no druggist who has or knows of the chromate of potash. Can you tell me where it can be had? Answer: Chromate of potash is a very common substance, and can generally be had of all dealers in drugs and dyestuffs. You can make the chromate by adding potash to the bichromate.

MOUNTING MAPS.—To J. B., of Mo.—In pasting cloth to maps, take common muslin, cut it to size, lay it on a smooth, clean board, and sponge it with water till it lies quite smooth on the board. Paste the map and lay it on the muslin, then rub carefully with a clean cloth till all the air bubbles and wrinkles are gone. Leave it on the board till quite dry, when it will almost fall off and be perfectly smooth.—F. H. W., of Mass.

COMBUSTION OF COAL.—J. S. J. asks how many cubic feet of atmospheric air are required to produce perfect combustion of one pound of coal, bituminous or anthracite? How many feet of air are usually passed, in ordinary practice, through the fire box of a locomotive or stationary engine, for each pound of coal consumed? Answer: 150 cubic feet of air are required for the perfect combustion of one pound of bituminous coal and 30 per cent more air for one pound of anthracite. Perhaps some of our locomotive friends will tell us how much air is generally passed through the fire box of a locomotive.

VERMIN IN DRIED FRUIT.—M. S., query 23, page 138, should put the fruit in a pan and set it over a kettle of boiling water until it is hot enough to kill any insect that may be in it. Then keep the fruit in a thick muslin or paper rack carefully tied or pasted that the worms may be kept out; but it will retain its taste longer if it is put in an airtight jar.—E. E. S., of O.

VARIATION OF THE POLE STAR.—L. H., query 3, page 106, is informed that the present distance of the pole star from the zenith of the pole is one degree thirty minutes.—H. W. G., of Mich.

CUTTING GLASS.—To J. W. A., query 18, page 153.—Cut from the edges of your glass a number of lines to the edge of your circle, taking care not to cross it. Tap gently with a knife or key, and the outer glass will come away in pieces as divided by the lines. Do not cut twice in a place, and do not try to cut both sides.—J. W. P., of N. J.

WATER VERMIN.—To A. H. R., query 19, page 138.—Go to the nearest river or pond, and with a small net (a piece of old mosquito bar will do) collect a dozen or more of the small fishes known as minnows and put them in your cistern, and, in a short time, you will have clear water, the wiggle tails and reddish colored bugs or lice being gobbled up by the fishes.—M. O'R., of Texas.

PAPIER MACHÉ.—W. P. F. will find the information he seeks on page 16, current volume of the SCIENTIFIC AMERICAN.—F. S. B., of Me.

STAINS ON BLACK MARBLE.—To S. M. T., query 1, page 153.

—Wash with a damp sponge; when dry, touch each spot with a solution of shellac in alcohol colored with a little fine lampblack, and continue to do so until the spots are hidden. Then rub lightly with soft cotton slightly moistened with alcohol until you have a fine polish.—E. H. H., of Mass.

NITRO-GLYCERIN.—To O. I. K., query 9, page 153.—Nitro-glycerin cannot be exploded by a common safety fuse.—E. H. H., of Mass.

BISULPHIDE OF CARBON.—To W. H. P., query 14, page 153.—This liquid can be used with safety for the purpose mentioned. It is made by distilling sulphur over red hot charcoal. It can be got from any manufacturing chemist.—E. H. H., of Mass.

SPECIFIC GRAVITY.—To J. P., query 15, page 153.—A body will weigh the same at the equator as at the poles, and specific gravity is the same without reference to latitude.—E. H. H., of Mass.

FLEAS.—I would suggest to T. J. W., query 6, page 153, one method of getting fleas out of the house. Work on the principle of the old adage that the hair of the dog will cure the bite. Our dog carried them away by being allowed to remain in the house through the night. I wash him thoroughly with strong soapsuds, then allow him to remain in during the night. The flea has a great affection for the dog, and consequently in the morning I find him well stocked, and I again take him out for another scrub. This continues to be the case as long as there is a supply of insects.—T. R. J., of Pa.

DETECTION OF SULPHURIC ACID IN VINEGAR.—Vinegars of commerce are frequently sharpened by the addition of sulphuric acid and pungent spices, which can be easily detected by evaporating a half gill in a saucer placed over boiling water. As it boils down, add a little honey. If the grape sugar it contains turns black, it is proof of the presence of sulphuric acid. As the last of the liquid evaporates, the odor of cayenne pepper, etc. (if there be any) can be readily distinguished.—G. H. C., of R. I.

PRESERVING THE EYESIGHT.—To J. H. D., query 18, page 138.—The decay of sight by age is simply a flattening of the eyeball; if you can restore it to its original form, you may dispense with spectacles. I am now near fifty-two years of age, and when I was about forty-five, I found my eyes would get fatigued by reading. I thought I should have to buy spectacles, but just then I saw an article in the *Herald of Health*, "How to restore and preserve the eyesight." The method is this: You shut your eyes, and press the eyeball with the finger and thumb from the outside corner of the eye towards the nose; the finger and thumb must go round the eyeball above and below about five minutes daily. I generally do it before I go to sleep as I lie in bed, because I shall not have to use my eyes again before morning. If you press from the nose outward it will do injury, as that way is for shortsighted people. I have never used spectacles and never expect to; this is written without them by the light of a kerosene lamp.—J. W. P., of N. J.

Communications Received.

The Editor of the SCIENTIFIC AMERICAN acknowledges, with much pleasure, the receipt of original papers and contributions upon the following subjects:

Car-Coupling Dangers.—By C. F. R.
Science and Theology.—By P. D. V.
The improved construction and propulsion of Lifeboats.—By L. S. F.

A Comparison of the Meetings of Religious and Scientific bodies—being a reply to an editorial article in the SCIENTIFIC AMERICAN, on the American Association of Science.—By E. S.

Horse-railroads without rails.—By R. B.
The Polar Sea and its cause.—By J. H. F.
An endless chain of vacuum air cylinders, operating within a water column.—By J. W. S.
Science and Theology.—By M. F. F.
The Day of Rest.—By J. T. N.
On the need of further Legislation relative to the construction of Sea-going vessels.—By W. W.

The late Edward Marcus Chaffee.—By A. R. T.
Force of Falling Bodies.—By G. M. T.
Sulphuric acid in Vinegar.—By R. H.
Old and New Inventions.—By J. H.
Theology and Science.—By G. N.
The need of better mechanism for Cider making.—By E. H.
On Animal Heat and Disease.—By A. B. M.
Car-coupling Dangers.—By G. F. W.
Car-coupling Dangers.—By C. S.
Theology and Science.—By J. E. E.
The causes and dangers of Kerosene-lamp Explosions.—By C. M. H.

Life preserving Garments.—By S. H. S.
Cheap Microscopes.—By C. S.
Milk sickness.—Its cause and cure.—By O. S. M.
The frozen well at Brandon.—By C. S.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.

SASH HOLDER.—Abraham Perron, of Stevens' Point, Wis.—This invention relates to a new and useful improvement in the mode of supporting and locking window sashes, and consists in a catch made to oscillate by means of a lever, so as to engage with the sash and hold it in any position.

APPARATUS FOR FEEDING THE CHARGE TO METALLURGIC FURNACES.—Giles Edwards, of Tannehill, Ala.—This invention consists in a feeding tube having a charging chamber with a valve at top and another at bottom to graduate readily the amount of fuel and its mixture with the ore, and thus to give the smelter entire control of the quantity and quality of the ascending gases.

BOLT CUTTER.—William F. Strong, of Charleston, S. C.—This invention consists of a peculiar arrangement of the stock, scroll plate, and cap of a chuck for holding and adjusting screw cutting dies or tap holding jaws, whereby provision is made for the application of a scale, adjustable stop bolt, and a stud pin for arresting the dies as they close upon the bolt at any predetermined point, for bolts of any sizes.

WELL TUBE.—Roswell R. Rouse, of Indianapolis, Ind.—This invention consists in making the tubes of cast or malleable cast iron with projecting ribs and perforated, and in soldering over its perforated sides wire gauze of the desired grade, so that, when the perforations are sufficiently large, the change from coarser to finer gauze, or vice versa, will fit the tube to serve as strainer in all manner of material.

WHIFFLETREE.—Jacob M. Isenberg, Huntingdon, Pa., assignor to himself and S. H. Isenberg, same place.—This invention consists of a peculiar arrangement of devices with sliding catch bolts on the whiffletree for engaging and holding the traces, whereby the traces may be detached and the horse let go by the pulling of a cord or strap.