ra to bring the picture out? A. A good developer is composed of 2 ozs. protosulphate of iron, and 4 ozs. acetic acid to 16 ozs. water.

(21) A. D. T. says: I have a porcelain slate which has become so smooth that a pencil will not make a good mark on it. What can I use to give it a good surface to mark on? A. If the slate is really porcelain, try a little dilute sulphuric acid, which allow to remain in contact with the surface a short time. Then wash carefully with clean cold water and flow over it a little strong potash lye. Allow this latter to remain in contact with the porcelain for about half an hour, and then wash clean with water.

(22) J. D. M. & Co. say: There is an article of vegetable origin used in Germany for cleaning kid gloves, and as a substitute for white of eggs in icing cakes. Can you tell us what it is? A. When the water that has been used to wash starch from wheat flour or scraped potatoes is allowed to stand until it becomes clear, and is then boiled, it assumes a turbid appearance, and deposits a flaky white substance, which has the same character as the white of egg, and is known as vegetable albumen. When dried, it forms a brittle, yellow, gummy mass, which dissolves in cold water; but when coagulated it will not dissolve in water, either hot or cold. The change of coagulation does not alter its composition. The temperature at which it takes place varies. A strong solution of the albumen in water becomes completely insoluble at 145° Fah., and separates in flakes at 167°. The more it is diluted with water, the higher the temperature of coagulation.

(23) H.O.R. says: I have a well 10 feet deep. About 3 gallons of paraffin oil has leaked through the clay floor, 12 feet from it. Can you tell me how to clean it, and destroy the oil? A. The ordinary means of destroying or absorbing the oil would not answer in this case, and we know of no means of cleaning the well better than those usually employed. If you have at hand some absorbent clay or earth, it would assist you.

(24) P. S. says: 1. I have made a Daniell's battery, and am trying to make a Neef's hammer for producing shocks. Please explain the easiest method for making it, and how to make the connections of the wires from the battery and to the handles. A. If you wish to produce shocks from a single coil in which there is an iron core, arrange the coil horizontally on a wooden base, fix a short round piece of soft iron to a spring, and fasten the latter to the base in such a position that the iron piece is within the attractive influence of the core. An upright with an adjustable screw, against which the spring rests when the battery is not in circuit, is also attached to the base back of the spring. Connect one pole of the battery to the upright carrying the adjustable screw, the other pole to one end of the coil, and the opposite end of the coil to the spring. By properly regulating the adjusting screw, the iron piece will vibrate rapidly; and if the hands grasp conductors in communication with the upright and spring respectively, more or less intense shocks will be felt. 2. What form of battery is best adapted for producing shocks? A. Two or three Grove cells will answer. 3. Will silver answer the same purpose as platinum for the connections on the spring platinum point for breaking and making the circuit? A. No.

(25) A. R. M. says: How can I make a cement for sealing glass bottles that will not soften at a temperature of less than 250° Fah.? The stopper of the bottle is made of tin. A. Cut 3 parts of good india rubber into small shreds; dissolve it by heat and agitation in 34 parts of cold naphtha. Add to this 64 parts of shellac in fine powder, and heat the whole, with constant stirring, until the shellac is dissolved. Then pour it while hot on metal plates, to form sheets. When required for use, heat to 250° Fah. and apply quickly.

(26) B. & F. say: 1. We are fitting up a line shaft to make 220 to 240 revolutions per minute. We think of putting in an engine of 10 or 12 inches bore by 24 inches stroke, running at 100 or 110 revolutions per minute, with an 8 feet fly band wheel, requiring about a 40 inch pulley on line shaft. Some of our friends say a shorter stroke engine will be more economical. If so, how much? And where is the economy? A. A shorter stroke will be more economical if you run your engine proportionally faster, so as to have the same speed of piston per minute, the economy being because the temperature of the cylinder will be maintained more equally, and nearly equal to that of the initial steam. 2. Would it be more economical to put on a smaller band wheel, with independent fly wheel? A. Yes, if the bearing surface of the working parts will stand the necessary increase of speed.

(27) A. B. asks: What is the property or substance in the human body that gives lead, inhaled or otherwise absorbed into the system, its remarkable noxiousness? A. The subtlety of the poison in the fluids of the body is brought about by the presence there of carbonic acid. The amount of lead which may be received into the body, and the length of time which must be consumed in its reception before symptoms of poisoning can be developed, is uncertain. These factors depend upon the peculiarities of the patient, the form under which the metal is introduced into the system, and the channel through which it makes its way. Sometimes a single dose (so to speak) will be sufficient to produce severe symptoms of poisoning, and again months and years may elapse before a man who is constantly at work will be at all affected by it. The excretion of lead after it has been received into the body is performed very slowly. In bad cases of lead poisoning, the metal can be detected in the urine a long time after the patient has been removed from the source of contamination. Parks mentions a case where a patient was exposed for the last time to the influence of lead on December 20, 1852, and lead was found in the urine on June 16, 1853, before treatment had been commenced.

(28) C. Y. asks: In $Na_2\ CO_3+10H_2O$, how can I cheaply and expeditiously get rid of several equivalents of H_2O so as to get a dry, white, almost anhydrous powder? I wish to gain the same result (in large quantities) as by letting it effloresce in dry air. A. Crystallized carbonate of soda contains 62¾ per cent of water. The crystals readily effloresce in the air, and melt in their own water of crystallization. On decanting the liquid from the fused mass, it is found that one part of the salt has given up its water of crystallization to another. By evaporation of this liquid, crystals containingone fifth less water than common carbonate of soda are obtained. These do not effloresce in air. The same result may be obtained by heating the carbonate in a current of dry air for a short time.

(29) W. T. S. asks: How can I produce a crystallized surface on tinned plate? A. Use a mixture of 1 part nitric acid, 3 parts hydrochloric acid, and 50 parts water. First clean the plate with a strong solution of potash in water. When the crystalline structure has become fully developed, remove the acid and wash in clean water.

(30) J. G. says: I have a paint mordant, which I cannot make work. This is the formula Mix 15 gallons water, 6 ozs. borax, and 3 lbs. silicate of soda. Heat until dissolved, then add 10 lbs. rosin, boil until dissolved. To this I wish to add rubber, but cannot dissolve the kind I have with benzine. It is old billiard cushions. How can I do it, and will rubber replace linseed oil and make durable paint? A. The rubber you mention is not suitable for the purpose. Use a purer rubber, and dissolve in the benzine by heat and agitation. This solution is not miscible with the solution of borax, water glass, etc., and will not replace linseed oil. 2. Would more water glass be of use? A. No. Shellac might replace part of the rosin.

(31) A. F. O. asks: 1. What is the process for enameling on zinc in making faces for common clocks? A. The zinc disks are simply painted with white lead, containing sufficient zinc-white to maintain the requisite intensity. 2 How are the the figures put on? A. The figures are worked on with stencil plates and afterwards finished with a brush; and finally the whole is finished with a coating of good picture varnish.

(32) E. C. N. asks: Why does paint which is made of pure linseed oil and lead affect young children and even some adults? A. There is no doubt that lead finds its way into the human body, under certain conditions, and there produces a variety of morbid changes, which may in some instances terminate in death; for the metal has often been found after death in the muscles, liver, brain, and other organs. White lead paint is introduced into the body in three ways: First, by the lungs. This takes place chiefly among house painters, when the lead is mixed with turpentine in large quantities. In the evaporation of the latter, a small amount of lead is carried off, and is breathed into the lungs. Lead dust may be taken in the same way. The second way is by direct absorption through the skin. The third method is by the mouth. When the painter is careless about his personal cleanliness, and neglects to change his clothing at meal time, a considerable quantity of paint may be taken into the body with his food and drink. This is especially true of his midday meal, which in many cases is eaten on the spot where his work is going on.

(33) J. H. L. asks: In the process of making malleable cast iron, is soft or hard cast iron employed? A. A mixture of two good sorts of No. 2 pig iron and old scrap is used, the latter in the proportion of $\frac{1}{5}$.

(34) J. S. G. says: In reply to a correspondent who asked for the method of calculating logarithms, you give the following: Let a=anynumber. Then $\log.\left(\frac{a}{a-1}\right)=0{\cdot}868589\times\frac{1}{2a-1}+$, etc. Why do you not tell us how you came by that number 0·868589? A. In the answer referred to, our correspondent only asked for a formula by which he could calculate the logarithm of a number. The demonstration of the formula would require considerable analysis, quite out of place in our columns, as the matter may be found clearly treated in a number of works, among which we may mention "Rudimentary Treatise on Logarithms," Weale's series, introductory to Law's "Tables," Hutton's "Mathematical Tables," Davies' Bourdon's "Algebra," and Todhunter's "Algebra."

(35) B. & H. say: Please tell us whether there will be any difference in the drawing power of two locomotives, of equal weights, etc., one of which has drivers of a larger diameter than the other. A. The smaller the driving wheel, the greater the leverage at which the power is working to the load, and hence the greater the tractive power.

MINERALS, ETC.—Specimens have been received from the following correspondents, and examined, with the results stated:

E. M.—It is red ocher.—H. W.—No. 1 is red oxide of iron or hematite. No. 2 is iron pyrites.—J. M. M.'s specimen is under examination, but no one has been able as yet to identify it.—Specimen from Noblesville, Ind., is iron pyrites.—Specimen marked "Eberhart" is sulphide of antimony. One marked "Cannon" is green quartz marked on surface by oxide of manganese.

R. C. C. asks: What was the Egyptian mode of incubation?—F. N. asks; How can I calculate the quantity of air that and the velocity with which it will pass through a given aperture at a given pressure?

COMMUNICATIONS RECEIVED.

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

On Storm and Flood Signals. By A. W.
On Cotton Factories in the South. By E. H.
On Timber Waste. By H. C. B.
On Bank Vaults. By J. K.
On a Patent Pirate. By C. F. J., Jr.
On a Mathematical Problem. By A. B.
On Boiler Explosions. By A. C.
On Centennial Circulars. By T. A. R.
On Mohair Goods. By O. C. K.

Also inquiries and answers from the following:
J. G. W.—F.W.—T. D. T.—E. H.—J S. W.—S. H.W.—J. L.—C. P.—R. F. J.—B. L.—C. K—T. C.—J. T.—T. H.—W. E. G.—B. D.—J. H. T.—G. C.—C. J, F.—W. T.—R. H.—S. S.

HINTS TO CORRESPONDENTS.

Correspondents whose inquiries fail to appear should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them. The address of the writer should always be given.

Enquiries relating to patents, or to the patentability of inventions, assignments, etc., will not be published here. All such questions, when initials only are given, are thrown into the waste basket, as it would fill half of our paper to print them all; but we generally take pleasure in answering briefly by mail, if the writer's address is given.

Hundreds of inquiries analogous to the following are sent: "Whose steam boiler is the safest? Who sells ready made iron fences, posts and all? Who sells egg-hatching machinery? Who sells bookbinders' cloth, dyed with permanent colors? Who makes machinery for cleaning moss for upholstery? Who sells the officinal preparations of boldo? Who sells penholders which teach the proper position for holding the pen?" All such personal inquiries are printed, as will be observed, in the column of "Business and Personal," which is specially set apart for that purpose, subject to the charge mentioned at the head of that column. Almost any desired information can in this way be expeditiously obtained.

[OFFICIAL.]

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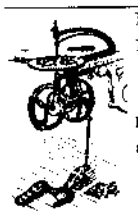

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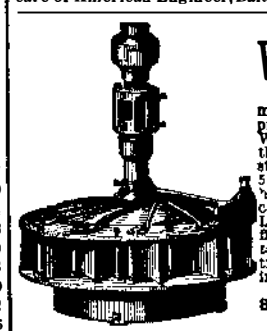

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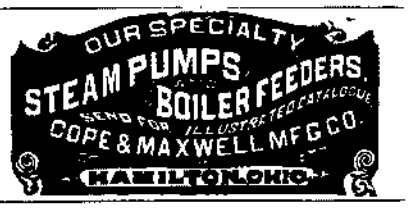

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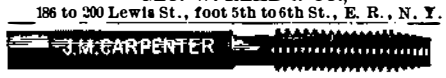

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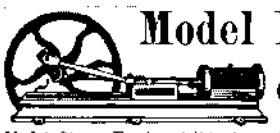

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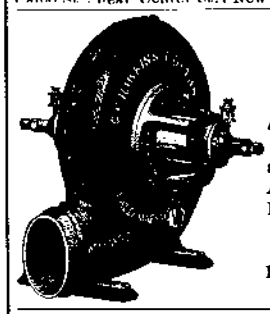

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