If the air, on being compressed, is allowed to cool, its pressure will be decreased. Then, if it expands, and does work, its temperature will fall: and if it is recompressed, without loss from radiation, its temperature and pressure will again be increased. All this is expressed in the simple statement that, if there is no loss of heat by conduction or radiation, the air that is compressed is capable of exerting as much power, in expanding, as was employed to compress it.

(38) A. A. P. says: Suppose I take a cylinder of iron that will hold a gallon of water, more or less: Can I increase the power of a press in using all the water at once, without introducing the water gradually into the cylinder? A. Yes.

(39) S. B. asks: How long can a man live in a submerged boat, the air capacity of which is 200 gallons? A. With proper arrangements, the vessel would contain a supply of air sufficient for between 1 and 2 hours.

(40) G. W. S. says: I tried to extract potash from corn cobs by burning the cobs to ashes, and leaching them with water. I then boiled the leachings to dryness, and the potash which was the result would attract moisture from the atmosphere and turn to a strong lye. How can I prevent this? A. The product you obtained was, undoubtedly, pearlash, an impure carbonate of potash. This should be calcined in a suitable furnace and packed in airtight casks, as it is very hygroscopic.

(41) C. M. R. asks: How can I coat some small castings, made of Babbitt metal or pewter, with tin or some white metal to keep them white? A. Make your castings of Babbitt metal; and they will wear well and keep as clean and bright as tin would.

(42) G. A. M. L. asks: What is the composition and process of manufacture of common white shirt buttons? A. Some varieties of these buttons are made as follows: Finely powdered steatite is saturated with soluble glass, dried, and repulverized, and the powder thus obtained is pressed into molds by suitable machinery. They are then baked or fired in ovens, again dipped in solution of soluble glass, and subjected a second time to the firing process. When cool, they are polished by being placed in a rotating cask with water, dried, and again polished by rotation in a similar cask with soapstone powder.

(43) J. A. H. asks: Where is the Pennsylvanian soapstone dug or quarried? A. At Texas, Nottingham, Unionville; in South Mountain, ten miles from Carlisle; and at Chestnut Hill, on the Schuylkill.

(44) A. L. S. asks: How can I perfume soft wood in pieces three inches long? A. The wood might doubtless be impregnated, by means of hydraulic pressure, with any of the essential oils, etc., but we know of no substance the perfume of which might be considered as permanent or inexhaustible.

(45) A. C. W. asks: What preparation will make gutta percha stick to wood? A. Melt together equal parts of pitch and gutta percha. Apply hot.

(46) E. H. asks: 1. What influence has vegetable charcoal on the system? The dose is a teaspoonful in water. A. Its antiseptic properties render it a valuable medicine in some affections. Is there any cure for catarrh of the throat and nose? A. The following has been highly recommended: Carbolic acid 10 drops, tincture of iodine and chloroform, each 7·5 drops. A few drops of the mixture should be heated over a spirit lamp in a small test tube, the mouth of which should be applied to the nostrils as volatilization is effected. The operation should be repeated in about two minutes, when, after the patient sneezes a number of times, the troublesome symptoms rapidly disappear.

How can I make paraffin varnish? A. Paraffin is soluble in benzine, benzole, bisulphide of carbon, etc., and may be recovered from such solutions on evaporation of the solvent.

(47) W. H. W. asks: How is compressed yeast made? A. It consists usually of beer lees, flour moistened with beer, and other fermented matter, the superfluous moisture having been removed by pressure. As a general rule, however, the recipes for the so-called yeast cakes, etc., are not made public.

(48) E. D. R. says: J. D. can clarify his cider by adding to each barrel of it 1 pint boiling milk; if the cider contains enough free acid to coagulate the milk, the coagulum, in precipitating, carries down with it all impurities held in suspension in the cider; this process has the effect of decolorizing the cider in some degree.

(49) S. S. S. says: I have been experimenting for 10 years on gums, trying to bleach them. I have succeeded with shellac, sandarac, copal, etc., but have not yet been able to bleach a solution of dark gum arabic. Do you know of any process by which gum arabic in solution may be bleached, without injuring the adhesiveness of the mucilage? A. Try filtering the dilute solution through a stratum of animal charcoal: and then concentrate by evaporation over a water bath. This, we think, will render your mucilage perfectly clear.

(50) H. C. asks: How long does it take the moon to make a revolution around the earth? A. The moon makes the tour of the heavens in a mean or average period of 27d., 5h., 43m., 11·5s., returning, in that time, to a position among the stars nearly coincident with that it had before.

COMMUNICATIONS RECEIVED.

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

On the Qualities of Sounds. By W. J. S.
On Industrial Expedients. By ——.
On Fog Signals. By W. B. T.
On Aerial Navigation. By E. M. B.
On Northern Lights. By L. B.
On a Solar Chronometer. By H. C. P.
On Advice to Engineers. By C. C. J.
On Repairing Bells. By J. E. E., and by J. H. B.

Also inquiries and answers from the following:

J. G.—B. A. P.—J. M. P.—J. J. M.—R. J. F.—H. B. J. J.—N. R.—W. B. W.—E. T. H.—T. E. C.—J. T. N.—E. G. F.

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: "Who sells the best photographic chemicals? Who makes the best brick-pressing machine? Who sells piano wire, in lengths of a mile and upwards? Whose is the best printing press for illustrated book work?" 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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8,572, 8,573.—EMBROIDERY.—E. Crisand, New Haven, Ct.
8,574.—FRAMES.—A. B. Dimmet, Bloomington, Ill.
8,575.—VASE HANDLE.—J. W. Fiske, New York city.
8,576.—FAN.—J. F. Langworthy, New York city.
8,577.—FINGER RING.—A. R. Lender, Washington, D. C.
8,578 to 8,580.—FANS.—S. L. Barinds, Memphis, Tenn.
8,581.—MEDAL.—J. C. Deming, Norfolk, Va.
8,582.—DANCE PROGRAMME.—P. Hake, Hoboken, N. J.

CANADIAN PATENTS.

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5,115.—J. Roy, St. Jean Baptiste, P. Q. Chair for sick persons. August 26, 1875
5,116.—L. Payette, Montreal, P. Q. Pontoon for raising sunken vessels. August 27, 1875.
5,117.—J. N. C. McIntosh *et al.*, Ypsilanti, Mich., U. S. Shaft support. August 30, 1875.
5,118.—O. J. Sickles *et al.*, Canton, N. Y., U. S. Milk cooler. August 30, 1875.
5,119.—J. D. Heebner, Norritonville, Pa., U. S., *et al.* Governor for horse powers. August 30, 1875.
5,120.—E. G. Scovil, Simonds, N. B., *et al.* Piling iron. August 30, 1875.
5,121, 5122.—G. N. Sanders, Jr., New York city. Spike. August 30, 1875.