Business and Personal.

The charge for Insertion under this head is One Dollar a line for each insertion; about eight words to a line. Advertisements must be received at publication office as early as Thursday morning to appear in next issue.

NEW BOOKS AND PUBLICATIONS.

THE MAGAZINE OF AMERICAN HISTORY. Edited by Mrs. Martha J. Lamb. New York: 30 Lafayette Place.

This monthly journal of history upholds the high standard by which it has been marked from its inception, and which was characteristic of all of Mrs. Lamb's preceding work. Its articles are all valuable, evincing sound judgment in the selection of subjects and faithful original research in their elucidation, while there is sufficient variety in the matter to render each number exceedingly interesting to a very wide range of readers. The frontispiece of the December number was a portrait of the late General McClellan, which is accompanied by an appreciative sketch by the editor. The series of articles on our "Historic Homes" is continued, with an illustration of the Brooklyn house of Philip Livingston, one of the signers of the Declaration of Independence, on what is now known as Brooklyn Heights; while there is a valuable article relative to the Massachusetts Constitutional Convention of 1788, a chapter on the Mexican war, and two contributions relative to our late civil war. The January number contains a steel plate engraving of General John A. Logan and a number of wood engravings illustrating incidents in our late war.

LONGITUDE BY LUNAR DISTANCES. By Major H. Wilberforce Clarke. London: W. H. Allen & Co., 1885.

Major Clarke has offered in this volume a method of calculating longitude by lunar distances in which the calculation is simplified by a division into several distinct steps, and is so presented that even the inexperienced traveler can, with a little patience, fix his position upon the earth's surface with precision. The moon has a daily motion among the stars of about 13°. The geocentric angles between the moon's center and certain of the stars and planets are given in the *Nautical Almanac* for every three hours of Greenwich mean time. If at any place the distance between the moon and one of these bodies be determined with a sextant or reflecting circle, and be corrected for semi-diameter, refraction, parallax, and spheroidicity, the geocentric lunar distance will be obtained; and this, when compared with the distance recorded in the Almanac, will give the longitude of the place. But this apparently simple calculation is decidedly difficult, and apt to deter one from making the effort, unless he be aided by some such systematic method as Major Clarke has suggested.

Golden Text Calendar. Selections from the best authors, and International Sunday School Lesson Text for each Sunday. By Mrs. A. C. Morrow. $1.00. D. Lothrop & Co., Boston.

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.
Minerals sent for examination should be distinctly marked or labeled.

(1) W. M. B. asks (1) if pine sawdust can be put to any profitable use. I have heard it could be mixed with pitch or resin, and moulded in brick for fuel. I am in the back woods, where several sawmills saw long-leaf pine, and the dust is thrown away. I wish to know what are the best steps to take to make it profitable and put upon the market? A. You can mix your sawdust with a little pitch or resin and mould it into bricks under pressure, to be used for kindling wood, but we doubt if you could make it profitable, on account of the expense of transportation. The sawdust may also be used in the manufacture of pyroligneous acid. 2. I have a lot of black walnut shells I wish to use in making walnut stain without use of water, as, when walnut stain becomes too thick or dark, it is thinned by adding turpentine. Turpentine and water won't mix. Please tell me what to do in this matter. A. Try dissolving out the coloring matter with alcohol or turpentine. 3. I wish to construct some cheap and convenient plan to use steam from a 20 horse steam boiler for steaming plank so as to bend easily for coffin sides. Please tell me how this process is done. A. An ordinary wooden tank or box arranged to use the exhaust steam from your engine will answer your purpose. Care should be taken that the steam pressure does not exceed the resisting power of the box. You will need to steam your plank for three or four hours before bending.

(2) F. S. asks the proper way to make a joint in a street main cast-iron water pipe; the proper material for piping leading from the main to the house; the proper depth to lay a main in a street; and whether there is any device for drilling, tapping, and connecting a pipe while main is under pressure? A. Lead is the only proper material for joints of street main pipes—a gasket of hemp being first driven into the bottom of the socket to keep the lead from leaking into the pipe. Then put a putty closure around the mouth of the socket, held to place by a rope, wood, or packed sand, with a hole at top to pour in the lead. When poured and cool, drive the lead in hard with calking tools. The leaders to houses should be lead or galvanized iron pipe. The connection with the main should be a brass drive cock, or may be made with a screw joint. The proper depth for mains in your State should be at the mid-winter frost line, probably seven feet. There are devices for drilling and driving or tapping under pressure. They may be obtained through the plumbing trade.

(3) W. W. W. asks: What is a good dip for cleaning brass patterns? A. They should not be dipped in any acid. Use only a soft brush dry, or wash with hot water, soap, and brush. This is the practice in the best malleable iron foundries.

(4) J. D.—You cannot practically operate a siphon more than 25 feet above the source of supply. All water contains air, which is liberated under partial vacuum, and will stay in the top of the siphon and break the flow. The plan that you have sketched is not practicable.

(5) O. N. L. asks: What preparation of glue is most suitable for facing cast iron pulleys? A. Glue, 1 quart, dissolved in cider vinegar; add 1 ounce Venice turpentine; boil gently for 12 hours. If the pulley has been used and is smooth, scratch the surface with a file.

(6) S. N. P.—For the galvanizing process see SCIENTIFIC AMERICAN SUPPLEMENT, No. 176. For tinning, to obtain smooth work, keep the surface of the tin bath clear with a little powdered sal ammoniac and doing the work quickly. If the articles are left in the bath too long, the tin absorbs iron and becomes thick, after which the surface of the tinning will come out rough. Smoothness of finish also depends much upon the smoothness of the pieces to be tinned.

(7) J. B. P.—There is no absolute difference in the heating power of a ton of anthracite coal, whether it be nut or pea, provided the quality is exactly the same in both. The price is the main point in their economical value as fuel. Formerly there was considerable difference in price, so as to largely favor pea coal where the grate was of the proper kind to prevent waste. There is sometimes much culm and dirt in pea coal, which is a cause of waste. This alone makes the nut coal a favorite among engineers. The whole question of economy turns on relative price, cleanliness, and carbon value, so that a decision cannot be arrived at on the simple question.

(8) W. D. A.—Copper lined tanks are often known to give trouble by leaking after a few years, much of which arises from the manner of soldering. Most plumbers use common solder, made of lead and tin. For this kind of work pure tin should be used, and the laps thoroughly sweated through. The nails should be also of copper. We know of no way of repairing for such leaks but to take out the lining and retin all the laps.

(9) J. M. G.—The rich, deep soils of Kansas only need thorough tillage for a few years to repress the weeds. Much of this trouble comes from neighboring untilled land, from which wild seed is blown by the strong winds of that woodless country. Too much land planted without the means for thorough cultivation is probably the cause of much of the trouble from weeds in wet seasons.

(10) R. M. F. (Philadelphia) writes: We have a large room, 60x100x19 feet, to heat by steam; how much pipe would it require, also how large a boiler? A. For your latitude, 2,500 to 2,800 feet 1 inch pipe, according to exposure, with 110 square feet effective heating surface in boiler, or an 8 horse boiler.

(11) F. H. H. asks: Why does not an emery wheel grind as well on the sides as it does on the radius? A. Emery wheels are used on the sides where fine flat surfaces are required. They do not cut as fast because a large surface is in contact with the face of the wheel. The convex surface of the periphery exposes but a small surface in contact at once, requiring but a small pressure to produce a cut.

(12) C. P.—There are so many ways in which engine pumps are affected that no proper solution of your troubles can be arrived at without personal inspection. Sometimes the plan of the valves is defective, so as not to allow of their closing at the proper time, either by the flow of water binding them against their guides or want of vent hole in the cap guide. At other times, air gets into the piston chamber and cushions under the action of the piston, and thereby prevents suction. We can only advise you to get some of your neighboring engineers to hold an inquest over the subject.

(13) T. H. D. S. asks: What do you think of the practice of some engineers and boiler makers of passing the products of combustion from the furnace of a coal-fired return tubular boiler over the top of shell to stack at rear end of boilers, after it has passed under the shell and through the tubes? Is it injurious to boiler? There is a difference of opinion among engineers as to the economy of passing heated gases of combustion back over the boiler. It is in some cases inconvenient for cleaning both boiler and flues. If the flue is neglected, the accumulation of ashes upon the top of the boiler makes the fancied superheating of steam a nullity. It is but little practiced.

(14) E. D. H.—In 1812 Samuel Slater began the erection of cotton mills in Oxford, now Webster, Mass. He had come to this country from England in 1789, when he was 21 years of age, but had then already spent seven years in the cotton mills of Derbyshire, and became familiar with Arkwright's processes. Before going to Webster he operated carding and spinning machinery at Pawtucket, R. I., commencing there in 1790. The machine for making cards was invented by Amos Whittemore, of Cambridge, Mass., and patented in 1797. Previous to 1813, the mills in operation were designed only for spinning, and the twist was sold to weavers. It is said that the first factory in the world conducting all the operations of converting raw cotton into finished cloth was built at Waltham, Mass., in 1813, by Francis C. Lowell, of Boston, this factory having a power loom somewhat improved from the then rather crude model of the British invention.

(15) W. D. O. asks: What is the best composition to remove scales from a boiler? A. Two or three pounds caustic soda dissolved in water and pumped into the boiler, allowing it to remain in the boiler for a day. Next day blow out, at intervals of two hours, one, two, or three cocks as convenient. The second application should be followed by cleaning boiler, if there has been much scale. Extract of tan bark is also used with the soda when it can be had.

(16) W. B. W.—You can use bevel wheels at any angle, as you have sketched.—The largest turbine wheels we know of are "Leffel's" 87 inch, of 1,400 horse power, with 40 feet head, using 21,000 cubic feet of water per minute, making 100 turns per minute; 80 to 90 per cent of the total water power is claimed for these wheels.

(17) W. B. writes: I wish to make an experimental battery for running an incandescent lamp. How many cells of the battery described in the SCIENTIFIC AMERICAN of April 11, 1885, would be required for a 12 candle power lamp? Would a ¾ inch rod do for the zinc plate? A. We cannot advise you to try to run a single incandescent lamp by means of a battery. You will require probably 50 cells of the battery referred to. We think a ¾ inch rod would scarcely give you surface enough.

(18) W. E. asks how celluloid electrotypes are made, and what is the composition. A. Celluloid is composed of vegetable fiber, such as cotton, dissolved in acids. Celluloid printing plates are made by pressing thin plates of celluloid into contact with type dies with heat.

(19) Subscriber asks if the double induction motor run by small water motor (capable of running sewing machine easily) will generate enough current for a small incandescent lamp without any change in present construction of motor. If so, what power lamp. And if change is necessary in the motor, what would it be? A. We think that the motor referred to is so small that when used as a dynamo it would not generate a current sufficient for running a lamp of any kind. 2. Are magnets for magneto bells constructed differently from magnets for common vibrating bells, and if so, which way are they wound (the magneto magnets), and how many layers of what number wire? A. The magneto magnets are permanent magnets. The armatures are generally wound with very fine wire, say 12 or 15 layers of No. 36.

(20) Reader asks whether it is feasible to coat a metal speculum with silver by precipitation. The speculum in question is badly tarnished, so much so that to repolish will destroy the figure. Now, if I can precipitate a silver film over the speculum, all difficulties will vanish. Will the silver act the same on the speculum metal as on a ground glass speculum, and if not, what will be the difference? Am afraid to try, lest I spoil the thing altogether. A. We think there would be no difficulty in coating a clean metal speculum with silver in the manner suggested, but we doubt if you can accomplish it with the badly tarnished speculum which you say you have; would it not be better to send your speculum to some reputable telescope maker, and have him clean it, and, if necessary, correct it?

(21) O. D. W. writes: We have occasion to stain wood with aniline. Is there anything to coat the wood with, or what ingredient could we use to put in the aniline to prevent the wood from fading, so as to keep its color? A. Dissolve your aniline in alcohol, and add to it white shellac varnish, or apply the alcoholic stain directly to the wood, and afterward apply any suitable varnish.

(22) H. K. asks: If a dynamo electric machine as described in SUPPLEMENT, No. 161, be built double the size, will it produce more than double the light, and will it run two 16 candle power incandescent lamps, and will a one horse power engine be sufficient to run it? A. A dynamo twice the size of the one referred to would produce more than double the current, if properly made. It might be arranged to run two 16 candle power incandescent lamps, if wound with wire fine enough to produce a current capable of overcoming the resistance of the lamps. A one horse power engine should run the machine.

(23) K. A. R. asks if cannel coal is more valuable than the soft coal so extensively used throughout the United States. A. We do not understand from your query whether you mean to inquire whether cannel coal is more valuable in a pecuniary sense, or as a fuel. Cannel coal of good quality always brings a very high price, and is therefore of greater value than the ordinary bituminous coal, and it is undoubtedly a more efficient fuel than the ordinary soft coal.

(24) F. W. S.—Electric light carbon is not adapted to use in the Leclanche battery. You should procure carbon plates about 1½ inches wide and ⅛ inch thick, made expressly for this use. The common method of connecting the wire with the carbon is to cast a lead cap upon the upper part of the carbon rod. The hissing in your battery is probably caused by the decomposition of the battery solution in the contact between the conductor and the carbon. Copper coated carbon rods are not available for batteries of this kind.—Plaster Paris is unfit for the porous cells. —Paraffine may be dissolved in naphtha or benzole.

(25) M. G.—We think your best course to secure an outline for a course in civil engineering would be to write to Cornell University, Ithaca, N. Y., for their prospectus.

(26) J. G. K.—There is no paint with which zinc can be coated to prevent its burning. Its melting point is 773° Fah.

(27) L. J. M. wishes a receipt for burnishing marble paper, such as bookbinders use. A. The paper is first coated with a little size, and the finish produced by friction by means of agate rubbers. Such paper is not made in this country, and cannot be economically manufactured on account of the high price of labor in the United States.

(28) J. W. K. asks: 1. Can you inform me how to make a burglar alarm, also what is the best