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.

ANWENDUNGEN DER MECHANISCHEN WÄRME-THEORIE AUF KOSMOLOGISCHE PROBLEME. Professor August Ritter, Ph.D. Hannover: Carl Rumpler, 1879. (The Applications of the "Theory of the Mechanical Equivalents of Heat" to Cosmological Problems.)

The object of the author is to deduce from the laws of the "Theory of the mechanical equivalents of heat," the properties of a heavenly body, floating in space and acted upon only by its gravity, the whole mass of the body being in a gaseous aggregate state. He also discusses the question: How would the present condition of the existing heavenly bodies harmonize with a gaseous aggregate state of the same; Also, the unstable equilibrium of the atmosphere, the temperature of an assumed atmosphere in the interior of the earth, the gaseous heavenly bodies, the relation of the mechanical action of gravity to the quantity of heat produced, the changes of the sun, the annual diminution of its radius, and numerous similar hypothetical subjects, are carefully and attentively discussed in six dissertations. These dissertations appeared in "Wiedemann's Annalen der Physik und Chemie;" the author has had them published as a separate work in order to induce others to interest themselves in these subjects and to examine and develop them. The author is Professor of Mechanics at the Technical High School at Aachen (Aix la Chapelle), and has a high standing in the scientific world.

THE MAGAZINE OF ART.

The Magazine of Art for September (Cassell, Petter, Galpin & Co., 596 Broadway, New York) is an unusually fine number. Lovers of art will appreciate the excellent illustrations and valuable information which this beautiful periodical supplies.

FORESTS AND FORESTRY. By S. V. Dorrien. New York. Paper, pp. 46.

This is a letter addressed to Verplanck Colvin, Esq., Superintendent of the Adirondack Surveys, on the importance of forests and their management in Germany, with a short review of the historical development of forestry.

Notes & Queries

HINTS TO CORRESPONDENTS.

No attention will be paid to communications unless accompanied with the full name and address of the writer.

Names and addresses of correspondents will not be given to inquirers.

We renew our request that correspondents, in referring to former answers or articles, will be kind enough to name the date of the paper and the page, or the number of the question.

Correspondents whose inquiries do not appear after a reasonable time should repeat them.

Persons desiring special information which is purely of a personal character, and not of general interest, should remit from $1 to $5, according to the subject, as we cannot be expected to spend time and labor to obtain such information without remuneration.

Any numbers of the SCIENTIFIC AMERICAN SUPPLEMENT referred to in these columns may be had at this office. Price 10 cents each.

(1) J. W. C. asks how to measure a building or rooms to heat them with steam. A. According to Haswell, one square foot of plate or pipe surface will heat from 40 to 100 cubic feet of inclosed space to 75° in a latitude where the temperature ranges from —10°. As a general rule 1 square foot of heating surface will heat 100 cubic feet in an inner room, and 75 in an exposed room.

(2) R. C asks for the rules for heating of buildings by steam and hot water; or quote the best authority. A. See reply to J. W. C. on this page, also consult "Box on Heat."

(3) H. B. asks: 1. Which slides of a vertical and which of a horizontal engine wear the fastest, also the reason, practically? A. It depends upon which way the engine runs. A moment's observation should satisfy you which slide receives the most pressure. 2. Why do locomotive cylinders wear most at the ends? A. Do they wear most at the ends? If so they wear differently from all other steam cylinders. 3. Where can I obtain information about cycloids? A. In any good geometrical work. 4. What is the best works on locomotives for a young mechanic to study? A. "Forney's Catechism of the Locomotive" and "Clark on Locomotives." 5. What course of draughting would you advise a young mechanic to go through? A. If without a teacher, study MacCord's drawing in SCIENTIFIC AMERICAN SUPPLEMENT.

(4) C. B. writes: 1. I have had a practical optician experimenting the "new camera lucida," as described in SCIENTIFIC AMERICAN SUPPLEMENT, No. 158, and he can make nothing of it. Please give me the address where they may be had. A. As some of the draughtsmen in this office have made cameras from the directions given in the SUPPLEMENT, we conclude that you have not followed directions carefully. The address of the inventor of this form of camera lucida is given in the article referred to. 2. Also, is there a way to cast under pressure, and how? A. Pour your metal into the mould through a tube and leave a column of metal standing in the tube. If the metal melts at a high temperature the tube should be lined with clay or moulding sand. 3. What is the composition of oreide, that watch cases are formed of sometimes, and in what proportions are the metals mixed? A. Oreide: copper, 73; zinc, 12·3; manganese, 4·4; cream of tartar, 6·5; sal ammoniac, 2·5, quicklime, 1·3.

(5) M. & L. ask: 1. Is the electric light more injurious to the eyes than the ordinary coal oil lamp? A. The light is not injurious, but to view the source of light is. 2. Is the electric light, described in SUPPLEMENT, No. 149, sufficient to light a room, 7 feet x 10 feet x 11 feet? A. The electric light referred to is designed merely for experimental purposes and not for continued use. 3. Will it answer to make the battery jars of the ordinary household bowls? A. Yes. 4. Are the zincs of the ordinary thickness as that used by the tinsmiths? A. No; the zinc must be at least ⅛ inch thick, and it should be thicker. 5. Are the carbon holders made of brass? A. Yes.

(6) P. S. writes: 1. I have some cotton covered copper wire; would it not be best to varnish it, to make the cotton stick to the wire better? A. Yes. 2. How many feet is 1 lb. No. 24 wire? A. About 800 feet. 3. Are the coils for an electric bell and an electro-magnetic machine wound opposite to each other, that is, one right and the other left handed? A. They may be wound in opposite directions, or in the same direction, provided they are connected so that the current traverses them in opposite directions. 4. Is it best to wind the wire directly on the soft iron core, or on a thin wooden spool? A. Wind on the core after wrapping it with paper. 5. How are spools wound to give shocks, and with what No. wire? A. See SCIENTIFIC AMERICAN, Vol. 39, p. 203 (14). 6. Is a Leclanche battery for an electricity machine good to give shocks? A. It will answer for temporary use, but is not suited for long continued use, as it quickly polarizes. You should use some form of constant battery. 7. What does cotton covered copper wire No. 24 cost a pound? A. $1.10. 8. Where are the ends of the wire from the coils of an electro-magnetic machine fastened? A. To the commutator cylinder. 9. Is it best to put a strip of paper under each layer of wire in the coils? A. Yes.

(7) H. N. C. asks: How many cells of the gravity battery will be necessary to heat a piece of platinum sufficiently to light the gas with? A. About 25.

(8) H. M. P writes: In the plan of the induction coil in No. 162, SCIENTIFIC AMERICAN SUPPLEMENT, the secondary coil seems to be wound in two sections. Is it necessary? Would it not be as well to wind it right across, and put a layer of shellac and thin paper between each layer? A. Many coils have been made in the manner proposed by you, but the plan given in the SUPPLEMENT is cheaper, and the coil made in that way is less liable to injury by internal discharges.

(9) O. E. P. writes: 1. I wish to transfer upon black painted work a large number of ornaments, borders, etc., in gold bronze, and propose to have them engraved and then printed and bronzed on paper, somewhat like the transfer ornaments used on carriage work. What preparation shall I use on the press in printing? Will the gold size usually used by printers answer? A. As we understand you, the printer's gold size will answer. 2. What kind of paper should be used? A. Use a heavily sized lithographic transfer paper.

(10) M. J. W. asks: Can animal fat be thoroughly incorporated with common clay? And can the whole be aerated? A. If we understand you, no.

(11) H. S. asks: What substance is put in safes to make them fireproof? A. The composition of 19 different fillings is given on p. 218 (17), Vol. 40 of SCIENTIFIC AMERICAN.

(12) "Reader" asks how to write or engrave in relief on zinc plates, for printing, as is done by zincographers. A. Use good lithographic ink, and etch with very dilute sulphuric or nitric acid.

(13) H. C. H. asks: Has there ever been a book of instruction published on lithography or photolithography or both; if so, where can they be obtained? A. Consult Vogel's "Chemistry of Light and Photography." See advertising columns for address of booksellers.

(14) S. E. T.—The wheel question, "How many times does a wheel revolve on its own axis, in traveling once around the periphery of a fixed wheel, both wheels being of the same diameter?" was so fully discussed a few years ago in the SCIENTIFIC AMERICAN, that we cannot again revive it. Many columns, for several weeks, were devoted to the discussion. The lunar motion argument which you now suggest was then presented. A pamphlet of over a hundred pages, called "The Wheel," was printed, containing the discussion. By a little perseverance and care in observation you can probably satisfy yourself by trial with a pair of wheels, that the moving wheel makes one revolution on its own axis and one revolution around the axis of the fixed wheel.

(15) W. F. asks: Is there a company making hydrogen gas out of water, on a large paying scale; if so, what is the process? A. See SCIENTIFIC AMERICAN SUPPLEMENT, No. 42, p. 654, Lowe Gas Process.

(16) E. B. T. C. asks: What medicine or combination will relieve me from the fatty substance, commonly called "black heads," which accumulates in the face? A. A very moderate diet and frequent bathing are among the best remedies.

(17) G. W. M. asks for the best varnish or preparation for the iron cover of a cistern to preserve it from rusting. A harmless substance is desired, as some slight portion of the rain water that falls on the flat cover is liable to enter the cistern. The water is used for domestic purposes. A. You may use genuine asphaltum varnish.

(18) E. J. S. desires information in regard to boring cylinder with boring bar, with the cylinder clamped on the carriage and the centers set out of line. Will the hole bored be round or oblong? A. Oblong or elliptical.

(19) G. W. L. writes: 1. I have a clock of the old kind, generally denominated "grandfather's clock," with a good walnut case, which is painted red. What process shall I take to remove red paint? I am desirous of having it painted with some other paint. I would therefore like to remove old paint without injury to the case. A. Warm the paint with a hot shovel held near it, or with the flame of an alcohol lamp, then remove the paint with a wide scraper. 2. I am running an engine 14x20, 120 revolutions per minute; the opening to admit steam to steam chest is 4 inches x 1¼ inches: is there area enough to feed cylinder of the above named size? A. It is about one half as large as it should be. 3. What should be the size of openings or induction ports of cylinder 14x20, making 120 revolutions per minute? A. About 9 inches x 1¼ inch. 4. Should like to know what examination a man must go through to be hired as railroad engineer, that is, to run locomotive? A. We do not know the character of the examination required on railroads; it is probably different on different roads.

(20) B. C. C. writes: Our engine started to cut in the steam chest, so that we had to get in a false face. This face is just large enough to hold all the parts; and then lead was run in at each end of the face to make it steam tight. Every six months the cylinder has to be taken off and the lead run in again to keep the face steam tight. Is there anything better than lead that will do to put in its place that will answer the purpose and will not have to be renewed, as it is a great deal of trouble to take off the cylinder every time it needs fixing? A. Type metal would be much better than lead. Use Babbitt metal if you cannot procure type metal.

(21) "Subscriber" asks: What is the ratio of iron and lime (as a flux) to the silica in the ore, and upon what does such ratio depend? Also, what is the simplest and best work published on lead smelting, and the reduction of argentiferous lead ores? A. The iron desulphurizes the galena, and the lime appropriates the silica which would otherwise combine with the lead. 100 lb. galena (clear) requires about 23 lb. iron (or its equivalent in iron ore), and the quartz sand in the neighborhood of equal parts of limestone. Consult parts 4 and 5, Percy's "Metallurgy." Your ore will be noticed under "minerals."

(22) J. S. T. writes: 1. I am experimenting with a new propeller. The model is 6 inches in diameter, and I would like to make models of the best that are in use to work against it. Please give the proportions. A. You should learn how to draw a propeller by studying "MacCord's Mechanical Drawing," in the SCIENTIFIC AMERICAN SUPPLEMENT; you will then be able to draw all the different forms. 2. If there is any treatise on the subject you would advise me to peruse, please state where I can find it. A. There is no one work published that would meet your wants; information on the subject is scattered through various books and periodicals.

(23) H. A. W. asks: 1. Would the easily made chromic acid batteries do for magnetizing a rattail file? A. Yes. 2. How many cells would it take to destroy life? A. With a suitable induction coil, 18 or 20 cells. 3. Where can I get the carbon pencils? A. From dealers in electrical supplies who advertise in our columns. 4. What size wire do I need for covering the file and how much? A. Use about 50 feet of No. 16 cotton covered wire.

(24) A. G. S. asks how to make the preparation that is put on cards which turn a different color when there is a change of weather. It is of a pale blue color when fair weather, but in damp and rainy weather turns a pale pink. A. Use a dilute solution of chloride of cobalt in soft water.

(25) A. J. H. asks (1) how to find the area of a piston. A. Multiply the square of the diameter by the decimal 0·7854; all engineers' pocket books have tables giving the area of circles. 2. The way to find the travel of piston in feet per minute? A. Multiply the number of revolutions per minute by twice the length of stroke.

(26) S. L. J. asks for the best recipe for making a strong quick drying paste or preparation of which flour is the base, similar to that used on envelopes or postage stamps. A. The mucilage is prepared from gum dextrine (British gum), 2 parts; water, 5 parts; acetic acid, 1 part; dissolve by aid of heat. Strain, and add 1 part 80 per cent alcohol.