NEW BOOKS AND PUBLICATIONS.

COMMERCIAL ORGANIC ANALYSIS. Vol. I. By Alfred H. Allen. P. Blakiston Son & Co., Philadelphia.

This is the commencement of a revised edition of a standard work, containing much later and additional information. It is intended now to treat the whole subject matter in three separate volumes, this one taking up bodies of the fatty series and of vegetable origin, and including chapters on the alcohols, ethers, and other neutral derivatives of the alcohols, sugars, starch, and vegetable acids. The work will be found especially valuable to manufacturers whose business requires any knowledge of chemical manipulations, and to all who have to examine commercial organic products for the detection of adulterations or sophistications of any kind.

THE WINDMILL AS A PRIME MOVER. By Alfred R. Wolff. John Wiley & Sons, New York.

This work gives a fairly complete elucidation of the mathematics of windmill construction, as necessary for the engineer, together with a history of the introduction of windmills, and accounts, with practical illustrations, of most of the more recent windmills which have been introduced in recent years in this and other countries.

MECHANICS OF MATERIALS, AND OF BEAMS, COLUMNS, AND SHAFTS. By Mansfield Merriman. John Wiley & Sons, New York.

This is a text book for the study of such only as have had a good training in mathematics and theoretical mechanics. It is designed for the use of classes in technical schools and colleges, and problems follow each article to enable the student to become well grounded in the theories stated.

THE ANGLER'S GUIDE BOOK. Compiled and edited by W. C. Harris. The Anglers' Publishing Company, 252 Broadway, New York. 288 pages. Price $1.00.

This is a very complete and useful book for persons having the propensity for fishing. It gives over 2,000 center points from whence over 7,000 angling waters are more or less accessible. It tells how to reach these points, the species of fish most abundant, the best months for angling, the kind of baits or flies to use, list of hotels or boarding houses with their charges, cost of guides, boats, and baits where necessary, and the cost of permits for fishing where required.

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 This is for our information, and not for publication.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 Information requests on matters of personal rather than general interest, and requests for **Prompt Answers by Letter,** should be accompanied with remittance of $1 to $5, according to the subject, as we cannot be expected to perform such service 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) E. E. W.—We think the steel and brass strips soldered together for a thermostatic bar the most sensitive, and of longer range than the bowed wire. For a hygrometer use a strip of flat sheep gut stretched across the inside of the incubator, with one end fast and the other hung by a light spring, using the movement of the point of attachment as an index.

(2) F. S. M. asks how acid coloring is done on gold. A. For small gold articles a very good plan is to place them on a lump of charcoal and make them red hot under the blow pipe flame, and then to throw them into a pickle composed of about 35 drops strong sulphuric acid to 1 ounce water, allowing the articles to remain therein until the color is sufficiently enhanced; washing the article in warm water in which a little potash has been dissolved, using a brush, and finally rinsing and drying in boxwood sawdust, completes the operation. See also Spons' Workshop Receipts, second series, which we can send for $2.00.

(3) D. D. L. writes: Some time ago you gave a cure for corus—collodion, salicylic acid and Cannabis indica. I find it takes a long time to dissolve. A. The proper formula is as follows:

Extract of Cannabis indica	5 parts.
Salicylic acid	30 "
Collodion	240 "

Mix and dissolve. The result is a clear light green solution. There should be no difficulty in its preparation. To prevent it from evaporating, keep the solution in a stoppered bottle. Be sure and use the Indian hemp, and not the American article; the latter is not easily soluble.

(4) A. A. O. asks if he could manufacture glue from dog fish. A. Glue is largely made from the skins and refuse of fish in the same way that ordinary glue is prepared from the skins and offal of land animals. Thus far, however, it has been found impossible to free it from the disagreeable fish-like odor, and also it does not gelatinize satisfactorily. In the East the scales of fish are thoroughly washed and placed in a glazed earthen jar, which is stoppered tightly and weighted so that it will remain under water. This jar is then placed in a pot of water until the scales are reduced to a semi-transparent viscous mass. Care should be taken that no water or extraneous matter, fluid or solid, be allowed to get into the jar with the scales. Consult also "A Practical Treatise on the Raw Materials and Fabrication of Glue, Gelatine," etc., price $2.50, by F. Dawidowsky.

(5) H. V. A. asks for directions for making a small mine lamp. A. To make a phosphorus lamp, dissolve 24 grains of phosphorus in an ounce of olive or cottonseed oil. The mixing should take place in a thin flask, which must be placed in hot water. When the phosphorus melts, cork the vial and shake vigorously until nearly cold. Upon being uncorked it emits considerable light. This preparation is an exceeding dangerous operation, and one demanding experience in the manipulation of chemicals.

(6) H. S. S., Jr., asks: 1. Would it be dangerous, in case of lightning, to run a wire cable from the roof of one block across the street to roof of another, both roofs being tin? A. Unless both roofs are well connected with the ground, the lightning striking one roof might be conducted to the other, thence through the house, doing damage. 2. What result do we obtain by mixing a solution of acetate of lead and a solution of sulphate of zinc? A. A precipitate of lead sulphate.

(7) C. G.—Silver is platinized as follows: Place some platinum in a small quantity of aqua regia or nitrohydrochloric acid, and keep it in a warm place for a few days, when it will have dissolved. As soon as it has dissolved, evaporate the liquid at a gentle heat until it is as thick as honey, so as to get rid of the excess of the nitric and hydrochloric acids. Add a little water, and it is ready for use. A dozen drops of this solution goes a long way in platinizing silver. The operation is performed in a small glass or beaker, covered with a watch glass to keep in the fumes, and placed in a little sand in a saucer to equalize the heat.

(8) W. J. G. asks: 1. I would like a receipt for a varnish suitable to revarnish walnut barber chairs. I want it so it will stain the bruised parts and will dry quick. A. Use either of the following: 1. Shellac 1½ pounds, naphtha 1 gallon; dissolve, and it is ready for use without filtering. 2. Shellac 2 pounds, benzoin 4 ounces, spirit 1 gallon. Either of the foregoing makes excellent furniture varnish. It is best, however, to first thoroughly remove all varnish and other matter on the wood before applying a new coat of varnish. 2. A receipt book giving receipts for making hair dyes, oils, cosmetics, pomades, etc., for barbers' use. A. There is a comprehensive treatise on perfumery and kindred arts by R. S. Cristiani, which we can send for $5.00.

(9) A. D. asks how to clean and polish sea shells, and what acids are used, if any? A. Shells are cleaned as follows: Make a lye by boiling strong ashes; allow it to settle, pour the lye over the shells, and boil them six or seven hours, or longer, if they are large; then soak, and wash often in fresh water. Dilute acids, such as hydrochloric acid, mixed with from ten to twenty parts water, will readily eat away any portion of the shell. If polishing is necessary, a little pumice stone and oil will make the surface smooth where desired.

(10) A. B. S. writes: There were formerly on the market maps of the Holy Land, the uneven topography shown in relief. After the plates were lithographed, how was this done? A. The maps you describe are probably first made in clay, from which a plaster cast is taken. Into this female cast the paper pulp is forced, and the resulting cast constitutes the map. The engraved sheet is wetted, then stretched over the model, and glued down, the paper giving wherever necessary.

(11) J. B. writes: I wish to run a steam pipe from my boiler to lint room in gin house. I wish to use this in case of fire. Would it be necessary to have the lint room very tight for the steam to extinguish fire? A. It is not necessary to have the gin house tight, but it is well to have the pipe pass around the gin room and terminate under the gin, with perforations at various points so as to distribute the steam quickly.

(12) C. E. P. writes: Is there a way of putting up hydrochloric acid in a dry form so it can be made into solution with water? I think there may be some powdered substance that will not change the character of the acid. It is used in the following way for the removal of tattoo marks on the skin: "Make a salve of acetic acid and lard, with which anoint the part marked, then rub vigorously with a solution of potash, and finally with diluted hydrochloric acid. A. Hydrochloric acid itself is a gas, and the acid of commerce is simply an aqueous solution of the gas. No practical method exists by which the gas can be used in the dry form. We do not believe that tattoo marks can be removed by the method suggested. As regards the preparation of such an ointment, the simplest plan would be to have it prepared by a pharmacist. The ordinary dilute solutions are made in the proportion of one of the substance to ten of water.

(13) L. H. S. desires a recipe for preventing mildew in blotting paper used in copying letters. A. If you dry the paper thoroughly in a current of air, no mildew spots should appear. As the mildew is a fungous growth, dipping the paper into some convenient disinfectant should be all that is necessary. A solution of zinc chloride, carbolic acid, oil of cloves, etc., we should think would prevent its appearance.

(14) G. H. asks: What is used to fill out little holes in cast iron to make it smooth, before japanning same? A. Fill the holes with iron putty made of iron filings or cast iron borings and boiled linseed oil or a little japan varnish. Make the putty as hard as possible; fill the holes, and bake to harden. When hard, smooth with sand paper, when it will be ready for japanning.

(15) J. A. A.—Wood engraving is one of the most difficult of occupations to become an expert in—much more so than an ordinary trade—and one seldom becomes moderately proficient in less than four or five years. There is always a demand for the better class of workmen, who are necessarily in some measure artists, but of poor engravers there is never any scarcity, and the price varies proportionately. There are classes in wood engraving for females at the Cooper Institute, New York, but practical wood engravers engaging to teach the business usually require a fixed sum therefor and a long time of gratuitous work.

(16) J. P.—The water percolating from a zinc lined refrigerator should not be used. It is undoubtedly poisonous, and the flavor is anything but palatable. Make a heavy tin plate box soldered with pure tin, with a close cover, fill with water and ice and set it in the ice box. A small butter jar with cover will be still better.

(17) H. A. L. asks how to remedy clothes which have become shiny. A. The shininess is generally due to wear, and under such circumstances cannot be restored. The following reviver may prove useful, however: Take of blue galls bruised 4 ounces, logwood, copperas, iron filings free from grease, each 1 ounce. Put all but the iron filings and copperas into 1 quart good vinegar, and set the vessel containing them in a warm water bath for twenty-four hours; then add the iron filings and copperas and shake occasionally for a week. The preparation should be kept in a well corked bottle. It may be applied to faded spots with a soft sponge.

(18) Scud asks: What can I coat a muslin bag with that will make it air tight, and also flexible, so that when not inflated it may be rolled and carried without breaking? A. Take 1½ ounces of finely cut shreds of India rubber and 1 pint of either chloroform, washed ether, or carbon disulphide; digest in the cold until solution is complete. It will dry as soon as it is laid on. Pure gutta percha may be substituted for the India rubber.

(19) W. F. B. asks: 1. If a nickel solution be made according to Mr. Weston's process, as described in SUPPLEMENT, No. 192, and 10 ounces of chloride of nickel be used with 4 ounces of boracic acid, what would be the amount of water required to make the solution? A. Use 1 gallon of water to 1 pound of the crystals. The exact quantity of water is not important, for the reason that just as fast as the nickel is deposited on the object to be plated the nickel anode gives up an equal amount of nickel to the solution, so that its composition remains constant. 2. Should a nickel solution be worked hot? A. The nickel solutions are worked cold. See Alexander Watt's "Electro-Metallurgy," practically treated. Price $1.00.

(20) V. B.—We cannot recommend the quality of an objective made from plate glass, unless it was thoroughly examined and found of even density. The curves cannot be given without a knowledge of the densities or refractive and dispersive indices of both glasses. You may make the radius of all the curves about 2½ feet with one side of the flint glass flat, and then make the correction of curves by trial and observation, in the absence of more positive knowledge of the nature of the glass.

(21) W. F. B.—The trouble with steam tricycles is not with the light engine, but with the heavy boiler, water, and fuel. They have been built in England to run 8 to 10 miles an hour. We do not think you can attach an engine and boiler to any ordinary tricycle that will be of much service. The power stated would no doubt give the desired speed. Fuel, water, and attendance make the trouble.

(22) E. J. W. asks: 1. What kind of steel is used in the manufacture of French cathedral bells? A. Best tool steel. 2. Is it used in a tempered or soft condition? A. Soft. Small triangles may be hardened.

(23) J. P. A.—We do not know of any cheap way of making small boilers; whatever pattern is chosen, there should be as much pains taken to have it well done as with those of a larger size. A horizontal cylinder 15 inches diameter, 2 feet long, with lower half filled with tubes of any convenient size, can be made by a coppersmith of suitable thickness for pressure required; 6 square feet of fire surface will be sufficient for one-third horse power. We do not recommend a pipe boiler, which if made of serviceable proportions is more difficult to make than one of copper.

(24) H. S. asks: Will you be kind enough to inform me which "system of stenography" you consider the most efficient and best adapted for practical use in regard to quickness and plainness for a beginner? A. Pitman's system is largely used by newspaper reporters. Graham's and Munson's systems are likewise both extensively used.

(25) W. E. S. writes, relative to the question of the moon's presenting to the earth the same side always: There may be known conditions in this problem not within my knowledge, which forbid the following explanation, but a very simple cause would seem to be sufficient to account for this phenomenon, to wit, a greater density in that part of the moon which is next the earth, as compared with the remainder, or such a shape of the moon as gives a greater amount of material in that part, with the necessary consequence, through attraction of gravitation, of holding that part always next the earth. A. Its form may not be a perfect sphere, and it may also be overloaded on the earth's side of its center of gravity. All these conditions have been derived from its original condition of rotation, and yet we do not know the fact of its initial rotation, or why it is different from its primary.

(26) D. T. writes: I wish to prepare different chemicals by using the direct process, avoiding double decomposition. I want to make borate of quinia. What quantity of each must be used? A. The information you desire is determined by calculation. A knowledge of stoichiometry must be obtained. Thus, for instance, in the case of barium sulphate, $BaSO_4$, we find that the atomic weight of Ba is 137; of SO_4, S=32, O=16×4=64, or 96; hence barium is $\frac{137}{233}$ of 100; or 59·23, that is to say, Ba combines with SO_4 in the proportion of 59·23 of Ba to 40·77 of SO_4. Therefore in every 100 pounds of barium sulphate there are 59·23 pounds of barium and 40·77 pounds of the SO_4. In like manner you must compute from the formula of borate of quinine the exact amount of quinine necessary for your preparation. Double decomposition in most cases is far simpler than a direct process.

(27) R. asks: What is a sure destruction to the small red ant? A. Powdered borax sprinkled around the infested places will exterminate both red ants and black ants. Powdered cloves is said to drive them away. Another plan is to grease a plate with lard, and set it where these insects abound. They prefer lard to anything else, and will forsake sugar for it. Place a few sticks around the plate for the ants to climb up on. Occasionally turn the plate bottom up over the fire, and the ants will fall in with the melted lard.

(28) W. T. H.—The sample is simply unsized paper dipped in a strong solution of Prussian blue. A good bluing solution is made by taking one ounce soft Prussian blue, powder it and put it in a bottle with 1 quart of clear rain water, add ¼ ounce of oxalic acid. A teaspoonful is sufficient for a large washing.

(29) F. B. D.—In the growth of vines and plants the stalks simply enlarge at the bottom, and put out the growth from the top; they do not pull or materially stretch their stalks out—A cloudburst is only a thunder storm of great intensity. Its effects are intensified in the canons of the Rocky Mountains by their steep and rocky slopes precipitating the water into the gorges. A water spout is the sucking up of water from sea, lake, or river by a tornado, which in its turn may become a cloud burst by its precipitation at a different locality.

(30) J. F. N. wants to know all about petroleum soaps and how they are made. A. Caustic lye at 36° B. is placed in a suitable vessel, and then equal parts of animal fatty matter and mineral oil are placed in separate vessels. The combined weight of the fatty matter and the mineral oil being taken as a standard, boric acid sufficient to dissolve the alkali is used; the mineral oil is heated to a temperature of about 90° Fah., and the animal fatty matter is melted by steam heat, and while in this condition a quantity of boric acid is dissolved therein, which, with that acid used as before, will make up ½ per cent of the combined weight of the fatty matter and mineral oil employed. The partly acidified animal fatty matter and the mineral oil, being heated in separate vessels, are now united by gradually pouring the former into the latter, with constant stirring or agitation, in order to effect a perfect combination; the acidified alkali is then gradually added, and the mass kept well stirred. The process of converting the mineral oil into a solid is completed by gradually adding the ordinary or unacidified alkali in sufficient quantity to effect this result, keeping up the agitation as before. When the entire mass is found to be granulated, the conversion into a saponaceous compound is complete. While animal fatty matter only has been mentioned, the same results can be reached by the use of vegetable fatty matters. The soap is finished by the free use of steam. Liquefaction is accomplished by a jet of steam to thoroughly deoxidize the saponified matter and disintegrate the compound. After the use of steam for this purpose, the soap is boiled by superheated steam.

(31) C. H. R. desires to know the ingredients of a cement or pitch used by brush makers in cementing hair in the handles of brushes. A. Paint brushes are made by inserting a bunch of full length bristles between two projecting prongs on the handle, and securing them by a wrapping of twine which is afterward coated with a covering of glue mixed with red lead. Equal parts of asphalt and gutta percha melted together and applied hot under a press will form a black cement of considerable strength.

(32) C. E. F. desires the receipt for making and applying the gilt or lacquer that opticians and manufacturers of electrical instruments use on most of their fine brass work. A. Take ¼ ounce gamboge, 2 ounces gum sandarac, 2 ounces of gum elemi, 1 ounce of dragon's blood, 1 ounce of seed lac, 2 grains of oriental saffron, and 20 ounces of pure alcohol. The tincture of saffron is obtained by infusing in alcohol for twenty-four hours, or exposing to the heat of the sun in summer. The tincture must be strained through a piece of clean linen cloth, and ought to be strongly squeezed. This tincture is poured over the dragon's blood, the gum elemi, the seed lac, and the gamboge, all powdered.

(33) W. S. M. desires a receipt for a cement that will stick leather, something that oil or water will not affect, and at the same time is pliable and will not crack. A. Gutta percha dissolved in carbon disulphide to form a mass of treacly consistence is probably the best cement for splicing leather. The parts to be joined must be thinned down; a small quantity of the cement is then poured on each end and spread so as to thoroughly fill all pores of the leather; the parts are warmed over a fire for a few minutes, applied quickly, and hammered well together. Or gutta percha 1 pound, India rubber 4 ounces, pitch 2 ounces, shellac 1 ounce, linseed oil 2 ounces, melted together.

(34) E. N. H.—Colored or plain engravings, photographs, water colors, oil colors, crayons, show cards, labels, etc., can be transferred to glass in the following manner: Take glass that is perfectly clear, clean it thoroughly, then varnish it, taking care to have it perfectly smooth; place it where it will be entirely free from dust; let it stand over night, then take your engraving or photograph and lay it in clean water until it is wet through, say 10 or 15 minutes, then lay it upon a newspaper, that the moisture may dry upon the surface, still leaving the other side damp. Immediately varnish the glass a second time, then place the engraving upon it, pressing it down firmly so as to exclude every particle of air; next rub the paper from the back until it is of uniform thickness, so thin that you can see through it, then varnish it a third time and allow it to dry. SCIENTIFIC AMERICAN SUPPLEMENT, No. 87, describes a magic lantern to be used.

(35) G. C. K. asks: How could I prepare helenina or elecampane to make tests with it in butter to keep? If it is wholesome for veal and eggs, it must be so for butter. Would alcohol in this case be detected? A. The helenina is obtained by evaporating the alcoholic solution to crystallization. You can then mix