

any further trouble? A. The contents should be blown out just as you blow out a hen's egg. The shells will keep indefinitely. 2. What is the easiest and best way of preserving birds after they have been killed? How do persons get birds that are wanted for preservation? Does not shooting them injure the plumage a good deal? A. You will need the "Taxidermist's Manual," which gives full directions for preserving and setting up of natural history specimens. Price \$2.50 mailed. It is a complete work for amateurs. 3. How do you account for worms so often seen in rain barrels after a storm? A. The worms were probably in the barrels before the storm and were only stirred up by the storm. 4. Will hair from a horse's tail change to a snake or to any other life form if placed in water? A. Horse hairs will not turn into snakes or other form of life.

(3135) M. S. S. asks: 1. Is there any way of taking the coating out of a copper tea kettle caused by boiling hard water? It is about $\frac{1}{4}$ of an inch in thickness and as hard as brick. A. If the deposit is calcium carbonate, it will dissolve with effervescence if muriatic acid, not too strong, is poured upon it. Quite a quantity may be required. If the deposit is calcium sulphate, you may very slowly dissolve it out by rain water, cold or hot. 2. How is rubber made into very thin sheets and forms, such as toy balloons, etc.? A. By slicing blocks of masticated rubber the sheets are made. They are then cut and stuck together with certain precautions, partly by natural cohesion, partly by the use of cement. For some notes as to the process we refer you to "Rubber Hand Stamps and the Manipulation of India Rubber," \$1 by mail.

(3136) J. S. J. asks: Will you please explain in your query column why soda water used in cutting steel leaves so much smoother, brighter surface than oil? A. Because the soda water being more fluid than oil flows to the cutting edge of the tool and lubricates the cut. The soda as an alkali gives the water a greater affinity for the oily surface of both the tool and the steel, and causes it to flow between the point of contact of tool and metal. Its cooling power is also greater than that of oil, which can be seen by the heat carried off in vapor at the point of cutting.

(3137) C. A. G. asks how to produce a low temperature sufficient to keep meat and other perishable goods, also bottle liquids, at little expense. A. The cheapest and most practical way in this latitude to produce a low temperature, except on the large scale, is by proper use of ice.

(3138) T. P. A. asks: 1. Will the motor in "Experimental Science" work as well with a drum armature? A. Yes. 2. What size wire should I use on armature and field for 110 volt circuit, and what would be its back E. M. F. so wound? A. You should wind your armature and field magnet so that their combined resistance will be about 30 ohms. If this is a shunt machine, three-fourths of the resistance should be in the field magnet and one-fourth in the armature. If it is a series machine, the resistance of the armature and field magnet may be about equal. 3. I have made a simple motor, as described in "Experimental Science," illustrating the Gramme ring, but can only get it to run about 100 revolutions. Will more wire and stronger field increase its speed? A. Probably you can increase the speed of your experimental Gramme ring by placing more wire upon the armature. We think you do not need a stronger field. 4. In a catalogue the Edison-Lalande battery is advertised (one style) as giving 15 ampere hours with resistance of 0.025 ohm. How can I calculate the E. M. F.? A. Divide the ampere hours by the resistance, and the quotient will be the E. M. F., which in this case is 0.6 of a volt.

(3139) N. C. H. A.—Concrete wall such as you propose would make a good foundation for your barn. Use 1 part best cement and 3 parts clean sharp sand. You can figure the quantities from the above. For prices write to dealers.

(3140) W. B. H. asks: What difference in pressure exists in top and bottom of a five foot boiler at a pressure of 80 pounds? A. The difference in gauge pressure at top or bottom is due to the height of water in the boiler. If there is 4 feet of water in the boiler, the bottom will have nearly 2 pounds more pressure than the top.

(3141) B. G. asks how to make birch beer out of birch bark or root. A. Take birch bark $\frac{1}{2}$ pound, hop $\frac{1}{2}$ pound, allspice $\frac{1}{4}$ pound. Boil in a few gallons of water for a few minutes. Mix with enough water to make 10 gallons, when below 100° Fah. add one pint of yeast. Allow it to ferment.

(3142) J. D. T. asks for the most simple and convenient way of fastening platinum tips to the copper wire of a cautery electrode such as is used in surgical operations, in which a white heat is necessary. A. Silver solder would undoubtedly make the best connection, but galvanic soldering with copper or even a screw clamp will answer.

(3143) E. C. K. writes: I have a five gallon nickel plating solution which has lately been giving very inferior results. I have decided to renew the bath and would like to know if you could inform me how to recover the nickel from the solution? A. Prepare a saturated solution of sulphate of ammonium. Add with constant stirring to the bath and let it stand. After a while a granular deposit of the double nickel ammonium sulphate will appear. If the supernatant liquid is colorless, the precipitation is complete. Otherwise add more of the ammonium sulphate. When complete precipitation has been obtained, pour off the liquid, drain the precipitate and redissolve for the new bath.

(3144) F. W. asks for a recipe for making soda foam that is used in milkshake. A. Take four pounds gum arabic in lumps of best quality, pour over it four pints of boiling water, and stir from time to time until dissolved. Strain through flannel if necessary. One or two pints of simple sirup may be added to help it to keep. One or two ounces to the gallon of sirup will answer for soda with sirup. For milk shake add in same proportions to the milk. Add one-half grain of calomel as a preservative.

(3145) J. H. A.—Your question as to whether *Syzygium jambolanum* is the correct name of the plant to which you refer cannot be definitely an-

swered until botanists tire of classifying plants each according to his own idea. The other names you give are synonyms of the above. We have not been able to find any other information in regard to the use of the plant in diabetes than that given in the SCIENTIFIC AMERICAN of October, 1888.

(3146) B. P. J. B. asks: Please give me receipt for making a white ink with which to mark on dark goods, such as umbrellas, black clothing, etc. A. Mix pure freshly precipitated barium sulphate or "flake white" with water containing enough gum water to prevent the immediate settling of the substance. Starch or magnesium carbonate may be used in a similar way. They must be reduced to impalpable powders.

(3147) W. R. B. asks how to remove ink from newspapers a couple of weeks printed, something that will not destroy print on back of the paper. A. Use javelle water or a solution of oxalic acid and tartaric acid in water. No bleaching agent affects printer's ink, but all ordinary writing inks yield to some of them.

(3148) G. E. asks: How many volts and amperes will it require to heat to cherry redness a piece of steel 12 inches long by $1\frac{1}{4}$ inches wide and one-twentieth inch thick? Of course the quality will make a difference. Please give me as close an approximate as you can. A. Taking the temperature at 1,500° Fah., a current of 565 amperes should suffice, maintained by a difference of potential of 0.07 volt; 30,000 amperes suffice to weld a pair of 1 inch copper round bars.

NEW BOOKS AND PUBLICATIONS.

TAXIDERMY AND ZOOLOGICAL COLLECTIONS. A complete handbook for the amateur taxidermist, collector, osteologist, museum builder, sportsman, and traveler. By William T. Hornaday. With chapters on collecting and preserving insects. By W. J. Holland. New York: Charles Scribner's Sons. 1891. Pp. xix, 362. Price \$2.50.

In this large and handsomely printed and illustrated book it seems as if taxidermy and its allied branches of the natural historian's work have at last been adequately dealt with. The subject is treated *ab initio*; it begins with the hunting of the animals and study of fresh specimens, and extends down to the final preservation of skins and mounting the same, and treatment of the stuffed and mounted objects. The entire field is covered, egg collecting and preservation, the making of casts, osteology, or the preparation and mounting of skeletons, and insect collecting and mounting are side branches that receive full treatment. Taxidermy proper fills the second part of the work, which includes some 158 pages. The subject is here given in full detail, with many practical hints from the author's own experience. Beginning with mammals, the subject of birds and crustaceans comes next, with final chapters on grouping, and even painting museum specimens. Insect pests, the collector's great enemy, are described, and methods of killing them are given. A bibliography of books of reference and a full index close the work.

THE ENGINEERING MAGAZINE. Published by the Engineering Magazine Company. World Building, New York. Monthly, 25 cents per copy, \$3 per year.

There is no better proof of the general interest that is being taken at the present time by the general reader, by business men, and farmers in scientific and engineering works than the fact that new journals and periodicals are constantly being established. A knowledge of engineering, of electricity, and mechanics is now considered one of the necessary concomitants of ordinary education. The *Engineering Magazine* is the latest addition to this class of literature. It is the same size as *Scribner's* or the *Century*, and is handsomely printed and is fully illustrated. The general character of the magazine may be judged from the subjects treated of, which include war ships of the U. S. Navy, a survey in a diving suit, the development of the South, healthful air in factory buildings, iron and steel industries in America, etc. There is also a department of architecture, electricity, mining, and mechanics.

COLOR MEASUREMENT AND MIXTURE. By Captain W. De W. Abney. London: Society for Promoting Christian Knowledge. New York: E. & J. B. Young. 1891. Pp. 207. Price \$1.

The well known author of this volume states that about ten years ago he began to work upon three measurements of the spectrum—the heating effect, the luminosity, and the chemical effect. The task thus set is completed, and in this attractively printed and well illustrated volume of the "Romance of Science" series we have presented in popular form the results of Captain Abney's work. The analysis of color and light by rotating disks is described, and the ingenuity shown by the writer, who was assisted by General Festing, is very evident. We commend the work to all interested in this field of physical science.

THE MAKING OF FLOWERS. By the Rev. Prof. George Henslow. (Publishers as above.) Pp. 168. Price \$1.

The "Romance of Science" series receives a notable addition in the present work. The anatomy of flowers and the meaning and function of their different parts, the specialization of flowers, and the many branches of this part of botany, are admirably treated by the well known author. His contention is that flowers have been moulded into their present forms by the agency of insect visitors, that their formation is an act of evolution, and he appears himself as a pronounced evolutionist.

COAL AND WHAT WE GET FROM IT. By Raphael Meldola. (Publishers as above.) Pp. 210. Price \$1.

The presentation of an account of the great industries based on coal, including the manufacture of gas, coke, and coal tar products, is the object of this work. The author in very limited compass presents a *resumé* of a vast collection of topics, and is obliged of course to treat them rather superficially. Yet the subjects seem

very nicely treated and to be well put. A chronological summary of some of the chapters is an exceedingly convenient and valuable feature.

The monthly Illustrated American.

The well known weekly journal the *Illustrated American* has won for itself universal recognition as a high art publication in every sense of the word. From the literary standpoint it can be judged no less favorably than from the purely artistic one. It has been well received by the public, so well indeed that its publishers have decided to issue a low-priced monthly edition, of which we have just received the first number. At the rate of \$1 per annum, or ten cents a single number, enough of the same grade of illustrations and matter of as high standards as that of the original periodical are given to at least convey a flavor of the real *Illustrated American*. The new enterprise intending to popularize the tendencies of the larger weekly deserves every encouragement. Many who take it will undoubtedly be led to patronize the larger periodical, whose present success should be increased by this venture. Meanwhile the weekly *Illustrated American* continues its course, one which can be commended as exemplifying the highest standards of illustrated journalism.

TO INVENTORS.

An experience of forty years, and the preparation of more than one hundred thousand applications for patents at home and abroad, enable us to understand the laws and practice on both continents, and to possess unequalled facilities for procuring patents everywhere. A synopsis of the patent laws of the United States and all foreign countries may be had on application, and persons contemplating the securing of patents, either at home or abroad, are invited to write to this office for prices, which are low, in accordance with the times and our extensive facilities for conducting the business. Address MUNN & CO., office SCIENTIFIC AMERICAN, 361 Broadway, New York.

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June 30, 1891.

AND EACH BEARING THAT DATE.

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