History and Mystery of a Teacup.

We possess a teacup which we value very much—in fact, it stands upon the top of our private bookshelves—and is the cause of many a pleasant hour's soliloquy. The reason that we like that teacup is, because there is a story connected with it, which we will shortly relate. It is not an ancient piece of pottery, dug from the ruined cities of Herculaneum or Pompeii; it was not found in a mummy's sepulchre, or under the buried stones of Babylon or Nineveh. Ptolemy never saw it, and Sennacherib had no idea of its existence. So we do not value it for its antiquity. The design is very rude; it consists of a square house on the borders of a lake, a bridge crosses the water, and three very unhuman figures are placed upon it; doves, or rather patches of blue representing them, are supposed to be flying in the sky, and the figures a vivid imagination could conceive to be two lovers, and the young lady's father. The trees are composed of round dabs of color upon straight lines, and a boat upon the water looks not unlike a square box, with a shingle for a sail. So we do not value the cup for either the accuracy of the drawing or its ancient worth. What, then, do we value it for? We will let the secret out now. Once upon a time, we had a notion—peculiar, but pleasant—of going into the state matrimonial. Bright notions of domestic bliss crossed our brain; and two pair of feet instead of one we saw in perspective upon our lovely fender; thoughts of buttons always on, and no strings ever off, flitted before us; and in a moment of enthusiasm, we began to furnish our home. Our first purchase was at an auction, and it was the identical teacup which is the subject of this meditation; hence our regard for it, and the veneration with which we look at it; it solaces our bachelor hopes and fears, for we are not married yet. "Why?" is no matter. Let us to our solitary cup of tea—we mean, teacup.

The regard we have for this teacup is based on this domestic incident, but has been strengthened by mature contemplation, for simple thing as it is, it is a monument of industrial skill, and a triumph of the ceramic art. From continued observation, we began to ask ourselves, "How was it made?" "where?"—and "from what material?" And having ourselves been pleased with the result of our research, we think it not unlikely that others may be so too.

At the very outset the name of "crockery" is suggested, which is most likely derived from the Irish word, *crock*, as "pottery" is from *pot*, and "porcelain," from the Portuguese word *porcellana*, a cup; thus the American for porcelain would be "cupper's ware," and the manufacture of it "cuppery." The manufacture of porcelain was first known and practised by the Chinese, who called the fusible ingredient of the ware, (which is a quartz rock calcined to deprive it of its water of crystallization and reduced to a very fine powder), *pe-tun-tse*. The Portuguese being the first European nation who visited China, naturally called the ware the name which had in their language a connection with its uses. From these words we may infer the fact, that all pottery was first used for cooking, and that man, having got the meat, next turned his attention to the utilitarian purpose of—making a vessel in which to cook it. And what so natural as the plastic clay that was to be found in almost every locality, a material that could be molded so easily when moist, and which retained its shape so well when dry? It was the very thing! It no doubt required no discovery, but was self-suggestive. The first mention we can find of the use of clay is in the third verse of the ninth chapter of Genesis, where it reads—"And they said to one another, Go to, let us make brick, and burn them thoroughly; and they had brick for stone, and slime for mortar." From the familiar style of the allusion to "brick," it is evident that the uses of clay were well known at that early age of the world's history.

In a very round-about way we have at last got to a starting point, namely, clay. The chemist will tell you that it is silicate of alumina, and the technologist will inform you of the fact that, to be properly plastic, it should consist, mainly, of one-third part of alumina, and two-thirds silica; that it owes its plasticity to the alumina, and that it ceases to be called "clay," when the silica is present in more than its fair proportion. It should be free from iron, so that it may burn white, instead of red, but the small quantities of chalk and magnesia often found as impurities do not much deteriorate its quality. The clay family is a pretty large one, and the relations—first, second, and third cousins—are found all through the mineral kingdom. They are descended in a direct line from Granite, the most ancient of rocks, who, having suffered by exposure to the weather and the constant mutations which are going on in nature, gradually allows his constituents, Messrs. Quartz, Feldspar and Mica, to become amalgamated into clays of various kinds; the purest and of course most respectable is Mr. Kaolin, or China clay, who may be called the aristocracy of clayocracy. This is derived from the decomposition of Feldspar, the change consisting in a removal of the alkali, potash, with part of the silica, and the addition of water; Mr. Feldspar being composed of thirteen-twentieths of silica, four-twentieths of alumina, and three-twentieths of potash. The Dresden porcelain is made from kaolin found in Saxony; the French from kaolin found at St. Yrieux-la-Perche, near Limoges; the English is found in Cornwall, and the only American deposit at present known is at Wilmington, Del. There is plenty in China and Japan, the very name "kaolin" being a corruption of the Chinese word *kau-ling*, (meaning *high-ridge.*) the name of a hill near Jauchan-fu, where this material is obtained. Common clay, soap-stone, and meerschaum, are various degrees of relationship to kaolin; and our teacup is made from a white variety of the former, called "potter's clay."

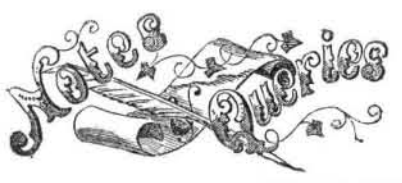
[Concluded next week.]

Flax Refuse—A Substitute for Rags.

The difficulty of procuring rags, the raw material from which paper is made, has become a matter of importance to all connected with literature, and many substances have been tried with different degrees of success; none, however, have been sufficiently successful to be commercially available, excepting wheat and oat-straw, and cotton waste, and these have been found only partial and imperfect substitutes. Mr. Houghton has recently patented a process by which he is able to take flax refuse (stuff which is burned to be got rid of, and the value of which is the cost of fetching it) into pulp equal in quality to the pulp produced from the best linen rags at a cost of from £28 to £30 a tun.—*Family Herald, London.*

[About three years ago we saw some very good wrapping paper made from refuse flax at one of the rope-works near this city. As there was quite a mountain of such refuse at the establishment, it, no doubt, would have been a great advantage to the owners of it, had they been able to make the paper at a paying price, but we understand they were not able to do so. There are thousands of loads of such refuse made at our rope-works annually, and it is only used for manure. We do not believe that it can make as good paper as linen rags because it contains much less fiber.

A number of experiments have been made by Dr. Angus Smith, in determining the impurity of the atmosphere, which have been published in the Glasgow *Practical Mechanic's Journal*. He has discovered that in a closely packed railway carriage there is one grain of organic matter in every 8,000 cubic inches of air—an unhealthy atmospheric condition, certainly.



*** PERSONS who write to us expecting replies through this column, and those who may desire to make contributions to it of brief interesting facts, must always observe the strict rule, viz., to furnish their names, otherwise we cannot place confidence in their communications.

WE are unable to supply several numbers of this volume; therefore, when our subscribers order missing numbers and do not receive them promptly, they may reasonably conclude that we cannot supply them.

J. H., of Ky.—There is one printing establishment in this city where type cast in words is used extensively. We are not aware of any advantage resulting from its use. Type thus cast is quite an old application, but has never come into general use.

H. E. G., of N. C.—The patents obtained for the manufacture of Kerosene, do not cover the obtaining of paraffine from mineral oils. You may use any substance you chose for purifying such oils. Common and well known apparatus used in candle works, is employed for extracting the parafine.

D. C., of Ky.—We have directed public attention on several occasion to the production of an indelible pencil. You should try and invent one to suit yourself.

L. G., of N. Y.—Thin steel blades have been proposed for blades of paddle-wheel. We believe that the propeller is the best device for boats on canals; the arrangement of your blades is not so good.

G. R C., of N. Y.—Resin gas at $7 per 1000 cubic feet is as cheap as coal gas at half the price, because it is about double the density.

N. H. B., of N. Y.—The pressure of a fluid is not equal on all the sides of a vessel; there is no pressure exerted on the top-side or lid; the pressure increases downward on the sides of a vessel in proportion to the depth of the column. A tube filled with water and sunk in the sea, with its ends bent upward to the surface, will maintain its form because the pressure inside will then be equal to the pressure outside; a fiexible tube is not well adapted in its nature for such an experiment.

J. J. C., of Ga.,—A person who can weld steel or iron perfectly, without the use of fire, richly deserves twice fifty dollars for his secret; it has never been patented, as far as we know.

H. C. B.,—of——. If you will send us your Post Office address, we will write to you about your spring lock for whiffle trees.

C. B. F., of Ohio, and W. C. E., of N. J.—The first American cent was coined about 1785 in Vermont, and had on the obverse a sun rising from behind hills, and a plow in the foreground—legend, *Vermontensium Res Publica*, 1786: reverse, a radiated eye, surrounded by thirteen stars—legend, *Quarta Decima Stella.*

John C. Dial, of Columbia, S.C., wishes to correspond with the manufacturer of Lemuel Smith's patent smut machinery.

G. F. U., of N. Y.—Cast iron head-pieces and monuments, with and without enameling, have long been made. There would be nothing patentable in making sign letters of plastic material in molds. They have long been made. You can purchase them at some of the crockery stores.

M. M. H., of N. H.—A British work on Heat, by Professor Macquorn Rankin, is reliable, but it is very abstract and dry. The ship berths intended to prevent sea-sickness are not used on vessels sailing from this port. Iron hammered at a high heat is not quite so strong as that hammered at a red heat, but it is customary to hammer and roll iron heated to a white heat until it becomes black on the surface. Machines for making wrought iron nails have not been extensively used.

A. C., of C. W.—We cannot refer you to any party who can furnish you with a machine for finishing and rolling morocco.

R. W., of Texas.—Your article on the trade winds would not suit our columns, for the reason that it is not a subject of much interest to many of our readers; nevertheless, we thank you for it.

A. F., of Mass.—We are of the opinion that a patent, if obtained under the circumstances you detail, would not be valid in law.

S. P. M., of Me.—You can remove ink blots from paper with citric acid, or a weak solution of oxalic acid. Apply it carefully with a sponge.

G. G. N., of Mass.—You can get a treatise on bridges by addressing Wiley & Halsted, Broadway, this city.

L. E. D., of Conn.—Carmine will make lac varnish red in color; verdigris will make it green; and ultramarine, blue. Write to S. K. Baldwin, Laconia, N. H., about a water-wheel.

J. F., of Va.—Tin plates are never soldered before they are plated. You can solder iron plates with common spelter if you moisten the edges to be soldered with the chloride of tin before applying the soldering tool.

C. H. S., of N. J.—To dye wood a red color, boil it in a strong solution of Brazil wood, with a little alum; to dye it blue, boil it in a weak liquor of logwood, containing a little blue vitriol. This latter color will not be very bright, but the method is simple. The wood should be white and free from rosin, or it will not take these colors. To dye would black, boil it in a strong solution of logwood and a little copperas.

H. C., of N. B.—If you will refer to Vol. IX., page 182 SCI. AM., you will find a description of the method of enameling iron. It would require too much space to describe it in this column.

J. C. L., of Pa.—It is not an easy thing to remove India ink from the human flesh. If you will refer to page 55, of this volume, you will find a note on "tattooed skin," which conveys the information you want. You will find it an unpleasant experiment to perform.

J. B., of Geo.—A cement composed of linseed oil and chalk would answer well to close up the cracks in your roof. We are not able to refer you to any one who would be likely to embrace your proposal about a saw-mill and tannery. Perhaps an advertisement in our columns might lead to a negociation.

K. Z. G., of Ill.—D'Aubisson's work on hydraulics is an able treatise. We think you can procure it of Wiley & Halsted, of this city. In reference to Boyden's turbine, address him at Lowell, Mass.

G. F. D., of Geo.—You will find your boiler much improved by encasing it in a jacket, to prevent the condensation of the steam; your cylinder would be much improved also by a similar arrangement. If you can change your feed-pipe from the front to the back end of the boiler, without much additional expense, we advise you to do so. The greatest evaporative effect will be obtained from increasing the fire surface.

H. P. B., of N. Y.—Your views in regard to gilding are gratefully received, but the details of the process are not so simple as the ordinary practice.

M. L. P., of Tex.—You are entirely in error about the pressure of steam on the valve, as is most conclusively proved by the concluding paragraph of your letter: for if the ports of the seat and cup of the valve were all stopped up, and the faces of the valve and seat fitted well enough to perfectly exclude the steam from between them, the effective pressure in the valve would be due to the whole area of the valve.

L. G., of C. E.—If your bear has been in a state of torpor, of course he does not use his substance up as fast as when awake and lively, so that it is not likely that he would change all his body in thirty days.

A. B. J. F., of Ind.—We would gladly send you the name of our southern correspondent who wrote us from St. James, but we have mislaid his letter and forgotten his name; besides, he did not authorize us to give his name to any one.

W. C., of Mass.—We thank you for your generous compliment. Please to send us that useful information on the hardening and tempering of steel. We would like it for publication.

P. S. S., of North Westport.—In what State do you reside? We have received your model and would write you if we could do so; but you have not given us this chance, through neglect.

C. N. M., of Pa.—The mastic cement for the fronts of houses is composed of 14 lbs. of clean, dry sand; 14 lbs. brick dust, and half a pound of litharge moistened slightly with boiled linseed oil. The brick wall receives two or three coats of oil before this cement is laid on. There is no work published in this country on the art of plastering.

C. O. F., of Me.—The specimens of hardened lumps of clay which you send us are called "clay-hurleys," and they are formed by the earth sticking to a bit of twig or (as in the case of those we received) a shell, and this, rolling down the hill, becomes rounded, and the sun hardening it, it assumes the appearance of a pebble, in which the bit of twig or shell is completely entombed.

P. F., of Cal.—In calculating the power of the engine to which you refer, the circumference of the cylinder was taken from a table instead of the area, hence the error. It would be well to use the divisor, 44,000, for a horse power, instead of 33,000, because we have always to deduct a fourth for friction. The horse-power of an engine with cylinder of 7 inch bore, piston 280 feet velocity per minute, and carrying 50 pounds pressure on the square inch is 12.24 after deducting a fourth from the nominal power.

O. P. S., of N. Y.—Paddles for the wheels of steamers set lower on their axes, and having one side heavier than the other to make them enter the water vertically are quite old, and were illustrated in our history of propellers, Vol. V., SCI. AM.

Money received at the Scientific American Office on account of Patent Office business, for the week ending Saturday, March 26, 1859:—

A. W., of Pa., $25; A. P., of Wis., $30; T. M., of N. Y., $30; M. B., of N. Y., $30; N. P. S., of N. H., $25; H. S., of N. Y., $50; D. A. W., of N. Y., $25; J. H., of Pa., $30; W. W. J., of Vt., $30; J. F. H., of Ill., $10; R. B., of Ill., $25; J. G., of Ga., $20; B. & B., of Ill., $47; C. & S., of Conn., $25; G. & T., of N. Y., $25; W. H. S., of R. I., $55; J. C. S., of Mass., $50; W. D. S., of N. H., $25; W. H., of Ill., $30; R. B. N., of Ala., $25; E. B., of Pa., $30; L. A. B., of N. Y., $12; D. L. H., of Ct., $25; E. R. D., of N. Y., $25; D. G. F., of Wis., $30; J. W. T., of Vt., $30; H. T. D., of O., $25; J. B., of N. H., $30; A. B. C., of Ga., $30; L. & P., of N. Y., $30; E. P. T., of N. J., $25; R. & S., of N. Y., $25; H. A. R., of N. Y., $57; J. R., of Pa., $35; G. M., of Conn., $35; I. P. T., of Md., $65; D. L., of Mass., $55; D. R. E., of Pa., $30; A. D., of N. H., $25; J. B., Ill., $35; J. R., of N. J., $30; L. B. T., of Mass., $25; J. A. T., of N. Y., $25; D. H., of Ill., $30; W. & M., of N. Y., $30; J. R. H., of N. Y., $25; L. & M., of N. J., $25; S. D., of N. Y., $55; J. L. N., of Ill., $30; C. J., of N. Y., $55, L. H. T., of R. I., $10; S. & J. T., of Pa., $30; D. J. O., of Pa., $30; S. B., of N. Y., $30, N. P., of Ind., $25; J. W. W., of Pa., $25; J. F. & E. P. M., of N. Y., $25; J. S., of Ind., $25; L. C., of N. Y., $30; C. C., of N. Y., $40; A. B., of N. Y., $145; W. A., of N Y., $25.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, March 26, 1859:—

W. D. S., of N. H.; A. W., of Pa.; H. S., of N. Y.; W. A., of N. Y.; J. S., of Ind.; R D., of Vt. (two cases); L. & P., of N. Y.; N. P. S., of N. H.; G. & T., of N. Y.; L. & M., of N. J.; W. H. S., of R. I.; J. R., of Pa.; J. R. H., of N. Y.; L. A. B., of N. Y.; D. A. W., of N. Y.; J. F. H., of Ill.; L. B. T., of Mass.; T. & T., of N. Y.; C. S., of N. Y.; B. & B., of Ill.; A. B., of N. Y. (two cases); H. A. R., of N. Y.; C. & S. of Conn.; N. P., of Ind.; E. R. D., of N. Y.; J. P. T. of Md. (two cases); R. B., of Ill., A. Y., of N. Y.; R. & S., of N. Y.; J. A. T., of N. Y.; S. D., of N. Y.; J. C. S., of Mass.; E. P. T., of N. J.; J. M. W., of Pa.; D. L. H., of Conn.; R. B. N., of Ala.; H. T. D., of O.; C. J., of N. Y.; J. G., of Ga.