Correspondence.

A Fossil Skeleton.

To the Editor of the Scientific American:

About three weeks ago, there was a report circulated in this vicinity that some men, while digging for water, had come across the skeleton of a most gigantic beast, the like of which had never before been found.

On hearing that the skeleton was on exhibition in this town, I went to see it. There were not many of the bones to be seen, but there were enough to give an idea of what the beast must have been.

The horn, which was the most conspicuous, I found to be eight feet nine inches in length and two feet one inch in circumference. It is slightly spiral and considerably curved in form tapering almost to a point; it is hollow for about four feet from the large end, which bears traces of having partly wasted away. There are three pieces of the jaw, one of which is two feet long and contains the two back molar teeth, and is one foot five inches from the joint to the first molar tooth. A similar piece of an ox jaw is about one half the whole length; so this,in the same proportion,would be about four feet long. This piece, which is of the lower jaw,is about six inches thick and eight deep. The largest of the teeth are seven inches long,and three and one half broad measured on the face. A joint of the back bone measured thirteen inches in breadth and twenty-one in hight; but it is broken on the upper end. The joint at the back of the head measured eighteen inches across. A bone, said to be the third short rib, is four feet five inches in length, and the bone from the knee to the ankle is seven inches across the top.

The horn in its present state weighs one hundred and five pounds,and one of the teeth weighs five and one half pounds. The bones are in a very good state of preservation, and also the horn; but the teeth (which are tubercular) are perfect, the enamel being as hard and intact as ever.

These remains were found in marshy land on the north shore of Lake Erie, eighteen inches underground; and over them there stood an oak tree three feet in diameter. There is more of the skeleton still under the surface, which will be taken out as soon as the frost is out of the ground.

Is this skeleton similar to that of a mastodon?

St. Catharine's, Ontario. A. R.

Kaolin in the United States.

To the Editor of the Scientific American:

Thirty-five miles from Omaha, Neb., there is a deposit of kaolin, about 30 feet thick and underlying about 100 acres. It crops along a bluff for over one half mile, with but a few inches of earth covering it. Beginning at the top, it is coarse and of a granulated nature; but as we descend, it grows finer, and is very fine and white near the bottom. It quarries in lumps,like chalk, and very readily dissolves in water.

Pure and free from foreign substances, it readily becomes pliable, and can be turned or molded into almost any form; and its shrinkage in drying is remarkably small. The difference of grades in fineness adapts it to the manufacture of a very large class of goods, such as are in demand throughout the West; and as it lies near the Burlington and Missouri Railroad, shipping facilities are convenient.

It makes a beautiful white brick, suitable for fronts and trimmings; and it seems well adopted for terra cotta, chimney tops, drain pipes, and all classes of jugs, crocks, etc., and is very superior for fire bricks.

This immense deposit, located as it is with timber, water, and all conveniences for manufacturing, offers, I think, a good opening for some capitalist to build up an immense business. I hope to see such a one take hold of and develop this material.

Omaha, Neb. J. M. GOODWIN

Setting Locomotive Valves.

To the Editor of the Scientific American:

In your issue of February 20, W. S. W. asks whether locomotive valves can be set without opening the valve chests? If the face of the valves and their seats are in good order, their adjustment may be determined with sufficient accuracy for all practical purposes by the issuing of steam from the water cocks in the bottom of the cylinders. This may be best done when there is but little pressure in the boiler, not quite enough to move the engine. Set the reverse lever to its extreme forward position, then open the water cocks and the throttle; then bar the engine forward, and, as the cranks approach their dead points, note carefully when the steam begins to issue from the water cocks. If the valves are correctly set, steam will begin to issue just before the cranks arrive at their dead points, owing to the lead of the valves. The amount of lead may be determined by placing a straight edge against the gland of the stuffing boxes of the valve stems, and marking (with a fine scratch awl) on the valve stem, just at the point where steam begins to issue, and then again just as the crank reaches its dead point; the distance between the scratches will of course indicate the amount of lead, and should not exceed one eighth of an inch for passenger engines, and less than one sixteenth of an inch for freight engines.

One revolution of the drivers is sufficient to examine each of the four dead points and adjust the lead and range of the valves, the range being adjusted by varying the length of the rods, of course, and the lead by moving the eccentric on the shaft, forward or back, as the case may be.

In setting valves as above explained, it is well to repeat the observation at each of the four dead points by moving the engine back sufficiently to take up the slack of the valve gear, and then bar it forward again and apply the straight edge as before.

To set the valves for the backward movement of an engine, the reverse lever must of course be placed at its extreme back position, and the engine must be moved backward instead of forward,otherwise the adjustment is of course precisely the same as for going ahead, except that all adjustment in the range of the valves must now be done by varying the length of the eccentric rods,because the least variation in the length of the valve stems would now upset the previous adjustment for going ahead.

Worcester, Mass. F. G. WOODWARD.

Method for Squaring Numbers.

To the Editor of the Scientific American:

In your issue of February 27, a correspondent gives a short method for squaring numbers ending with 5. There is an excellent rule for squaring any number; and by its aid the operation can be performed mentally on any number of not more than two figures. It is as follows:

Take the nearest number ending with a cipher to the number to be squared; if such number be greater than the one to be squared, subtract the difference between the two from the number to be squared, and if it be less add the difference; then multiply the number thus obtained by the one ending with 0, and to this product add the square of the aforesaid difference. The result will be the square of the numbers.

For example: Take the number 64. The nearest number ending with 0 is 60. The difference between the two is 4, which add to 64, making 68. Then 68×60,which can easily be performed mentally, is 4,080, to which add the square of the difference, which is 4×4 or 16. The result is 4,096, the square of 64.

If the number to be squared were 68, the operation would then be $(70 \times 66) + 2^2 = 4{,}624$.

This rule is always correct, easily remembered, and will often save time and figures. E. T.

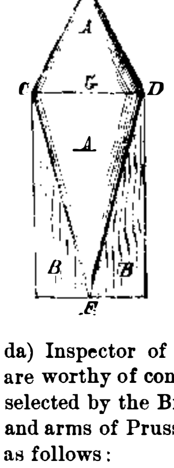
Newark, Ohio.

A New Rifle Projectile.

To the Editor of the Scientific American:

I enclose a sectional sketch of a projectile which I have invented. It is principally adapted to rifles. I believe I may safely say that I have made the longest shooting with it that was ever accomplished, *ceteris paribus*. Out of ten shots which I fired at a barn, at a distance of 2,773 yards, five passed through two boards, each over an inch and a half in thickness, and the sixth passed through the first board, and afterward became imbedded in a post.

I used a common rifle, an old one, without any of the modern improvements; judging from the circumstance that it originally had a flint lock, it must have been made at least forty years ago.



A is the projectile. B is a wooden cover in which the shot is placed. It serves two purposes: 1. That of filling up a space. 2. That of preventing windage, which it effectually does. C D is the waist. It comes, or was intended to come, in contact with the rifling of the cylinder. Proportions: C D = diameter, E G = 1 diameter, F G = 2 diameters. Were the projectile designed for a field piece the waist would be broader, and would be fluted for the purpose of receiving a band of softer metal, upon which studs would be placed.

Colonel Strange, R. A., Dominion (Canada) Inspector of Artillery, whose opinions on such matters are worthy of consideration, and who was one of the officers selected by the British Government to report on the artillery and arms of Prussia and France during the recent war, writes as follows:

J. Macdonald, Esq., London, Ont.:

Dear Sir:—I have to acknowledge the receipt of yours of January 8, 1875, inclosing description of a projectile proposed by you, and asking my opinion. 1. I am not surprised at its having an extremely long range. The form is exceedingly favorable not only to overcome resistance from air in front, but the projectile would be less retarded than those of the ordinary form (that is, with a flat base) by the vacuum formed behind the projectile when it moves with a velocity greater than the air can rush in behind it, which is a source of retardation at high velocities.

2. The center of gravity of your projectile is in about the right place, if the rifle had a quick twist; otherwise it would have a tendency to drop in front at extreme ranges.

The causes which led to the good shooting are probably:

a. The wood, having a lower specific gravity than the lead, was forced forward by the discharge and filled up the grooves of the rifle, imparting a twist and preventing windage. If you examine the bullets, you will find probably that not even the waist was cut by the grooves.

b. In the service artillery projectile, no part of the hard metal comes in contact with the gun.

c. The drawback to your system would be the difficulty of fixing a ring or studs of soft metal at the waist, which is and must be narrow to preserve your form.

d. The effect of field artillery depends on the shell power. Solid rifled artillery projectiles are obsolete. The space for powder in a common shell, on which its destructive power depends, is much diminished in your form of projectile.

e. Also the space for bullets in the Shrapnel shell.

I would not wish to discourage your researches, especially as you have hit on correct principles. Excuse haste and a candid reply.

T. B. STRANGE, Colonel,
Dominion Inspector of Artillery.

You are at liberty to make what use you like of this communication. J. MACDONALD.

London, Ontario

Experiments with Honey.

To the Editor of the Scientific American:

On page 132 of your current volume, I noticed that one of your correspondents has great difficulty in preserving strained honey. Perhaps it would be of interest to him, as well as other readers of your valuable paper,to know that candied or crystalized honey can be permanently restored to transparency by the following method, which I have found successful: Take a flat bottomed pan, as deep as the bottles containing the honey, and fill it with cold water; place the bottles in it so as not to touch each other, put it on a slow fire, and heat it up to 212° Fah., and keep it at that heat until the honey is clear. Remove the pan from the fire, and you will have no further trouble with the honey.

Pittsburgh, Pa. A. L. F.

Tests of Vulcanized Rubber for Belts.

Chemical analysis, in the majority of cases, is powerless to determine the quality of vulcanized rubber, and the consumer is usually left to mechanical tests of the article furnished him, in comparison with other and similar products of known excellence, in order to find out whether the former is adapted to his purpose or attains a fixed standard of efficiency. These trials consist in examining the comparative degrees of elasticity and tenacity. The manner in which they are conducted in the French navy appears to us practical and easily followed. The first test consists in cutting from the sheets samples, which are left in a steam boiler under a pressure of 5 atmospheres for 48 hours. At the end of this time, the pieces should not have lost their elasticity. The specimens may then be placed on the grating of a valve box, under a pressure from above of 85·5 lbs. per square inch, and should withstand 9,100 strokes at the rate of 100 per minute. Specimens not boiled should withstand 17,100 strokes. Thongs of rubber boiled, and having a section 0·6 inch square and a length of 8 inches, fixed between supports and elongated 3·9 inches, should resist without breaking a further elongation of 8 inches, repeated 22 times a minute for 24 hours. Thongs not boiled, under the same conditions, should resist for 100 hours. These extra elongations maybe easily made by a wheel, to the periphery of which one end of the thong is fastened, while the other extremity may be attached to a support. By turning the wheel, any determined elongation may be given at the rate of from 20 to 25 times per minute. Under the above conditions bands of first quality rubber, perfectly pure and well vulcanized, break after 180 or 200 elongations of 8 times the initial length. Bands cut from pure rubber, but of secondary quality, break after 50 or 60 elongations. Inferior caoutchouc, containing mineral matters or residue of old vulcanized rubber, gives no results at all.

M. Ogier (from whose valuable paper, recently read before the Paris Society of Civil Engineers, we extract the main facts of this article) has investigated the properties of rubber belts made of repeated layers of cloth covered with prepared rubber. Through the adhesive nature of the caoutchouc, the superposed tissues form, after vulcanization, a homogeneous substance, comparable, in M. Ogier's opinion, to the best curried leather. His experiments, in order to obtain the coefficient of friction of these belts on cast iron pulleys, give us results varying from 0·42 to 0·84, as against the coefficient for leather, 0·28. The minimum value corresponds to canvas and rubber belts without an exterior rubber coating. On pulleys of various forms, the maximum value of the coefficient of friction was found on those slightly convex and presenting a roughly turned surface, this result being inverse to that obtained with leather belts. Similarly the presence of fatty bodies has an opposite action on the cloth and rubber belts to that which it has on leather. On covering the former with a light varnish of half olive oil and half tallow, the adhesion was found to be considerably augmented. This fact M. Ogier, who does not counsel the use of the varnish but for rubber-coated belts, attributes to a resinification resulting from an action on the mixture of the excess of sulphur, which the caoutchouc always rejects after a certain period.

Experiments were also instituted on leather and rubber belts, in order to determine their resistance to rupture, and the law of elastic and permanent elongations obtained under increasing stress. These trials were made on belts 117 inches long, suspended from a crane by jaws, and carrying at their lower extremities other jaws which sustained the weight. Both pairs of jaws grasped the leather for a sufficient distance to preclude any possibility of slipping. The belts were allowed to remain under stress for an hour and a half before the elongations were measured. The results obtained may be summarized as follows: 1. The resistance to traction of rubber and canvas belts per square millimeter (0·0009 square inch) of section is at least equal to that of leather belts. 2. This resistance per square millimeter is independent of dimensions—length, breadth, or thickness. Such is not the case with leather belts, and therefore preference should be given to rubber belting whenever the conditions of the power to be transmitted necessitate the employment of very long, very wide, and very thick belts. 3. From two trials it appears that the external covering of caoutchouc adds nothing to the resistance, and hence it is advantageous to use covered belts which, at equal weights and prices, give a superior resistance. 4. Under the same weight the elastic elongation of leather belts is double that of rubber ones. The permanent elongation, under a change of 0·55 pound per square millimeter, reached 2 per cent in the former and nothing in the latter.

This last fact is worthy of special note, since the lack of success of rubber belting, in many cases, may be traced thereby to the fact that a workman, used to leather belting, treats rubber naturally in the same way. He tightens the latter when it slips, a proceeding which results in breakage or rapid destruction through use at too high a tension. M. Ogier concludes that, in the present state of the leather and rubber industries, the price of installation, useful effect be ing considered, of leather and rubber belts is about the same, but the cost of maintenance of the latter is small when compared to that necessitated by the use of leather belts of large dimensions.

Electric Lathe Chuck.

In order to obviate the inconvenience and loss of time involved in the ordinary mode of fixing upon a lathe chuck certain special kinds of work, such as thin steel disks or small circular saws, the chuck is converted into a temporary magnet, so that the thin steel articles, when simply placed on the face of the chuck, are held there by the attraction of the magnet; and, when finished, can be readily detached by merely breaking the electric contact and demagnetizing the chuck. The face plate of the magnetic chuck is composed of a central core of soft iron, surrounded by an iron tube, the two being kept apart by an intermediate brass ring; and the tube and core are each surrounded by a coil of insulated copper wire, the ends of which are connected to two brass contact rings that encircle the case containing the entire electro-magnet thus formed. These rings are grooved, and receive the ends of a pair of metal springs connected with the terminal wires of an electric battery, whereby the chuck is converted into an electro-magnet capable of holding firmly on its face the article to be turned or ground. For holding articles of larger diameter, it is found more convenient to use an ordinary face plate, simply divided into halves by a thin brass strip across the center; a horseshoe magnet, consisting of a bent bar of soft iron, with a coil of copper wire round each leg, is fixed behind the face plate, each half of which is thus converted into one of the poles of the magnet. The whole is enclosed in a cylindrical brass casing, and two brass contact rings fixed round this casing are insulated by a ring of ebonite, and are connected with the two terminal wires of the magnet coils. A similar arrangement is also adapted for holding work upon the bed of a planing or drilling machine, in which case the brass contact rings are dispensed with, and any desired number of pairs of the electromagnetic face plates are combined so as to form an extended surface large enough to carry large pieces of work. For exciting the electro-magnet, any ordinary battery that will produce a continuous current of electricity can be used; but in machine shops, where power can be obtained, it is more convenient to employ a magneto-electric machine—such as Gramme's, for instance—rather than a battery.

The Pyrophone.

At a recent meeting of the Society of Arts, London, a paper, descriptive of M. Kastner's new musical instrument, the pyrophone, was referred to. One of the instruments was in the room, and was experimented upon in the course of the evening. It was composed of a frame enclosing glass tubes, arranged in the form of the pipes of a small organ. In each of the tubes were two jets of gas, which were made to unite and separate by the action of keys, and thereby produced musical sounds. The paper, after describing the sound of the pyrophone, proceeded to explain the principles on which the sounds were produced. A very simple mechanism caused each key to communicate with the supply pipes of the flames in the glass tubes. On pressing the keys the flames separated, and the sound was produced; as soon as the fingers were removed from the keys, the flames joined, and the sound ceased immediately. If two flames of suitable size were introduced into a glass tube, and they were so disposed that they reached one third of the tube's hight, measured from the base, the flames would vibrate in unison. This phenomenon continued as long as the flames remained apart, but the sounds ceased as soon as the flames were united. The chairman, Lieut.-Col. Strange, said that this instrument was the invention of a young man who did not claim merit for it as a musical instrument, but as a scientific experiment, which, he hoped, would be of great value in the musical world.

The engraving of the pyrophone appeared in Vol. XXX, SCIENTIFIC AMERICAN, page 279.

The Morse Telegraph Alphabet.

At a recent meeting of the Scottish Society of Arts, Edinburgh, Dr. Russell, Demonstrator of Anatomy to the University, read a paper on "The Telegraphic Alphabet as a branch of Technical Education in Primary Schools."

In the course of his remarks, the lecturer explained the structure and uses of the Morse or telegraph alphabet, by means of a diagram, advocated its introduction into primary schools, and more especially into those situated along the coast. He then proceeded to mention some of the advantanges possessed by the alphabet as a means of communication. Among these were its extreme simplicity and the ease with which it could be learned by very young children; that it helped to prepare for post office employment and a seafaring life; that it was already known all over the world by experts; and that it could be used with or without any apparatus—an advantage which the lecturer believed was not possessed by any other method of signaling; that it involved no expense; that it formed a good alphabet for the blind; that it developed the sense of time or rhythm; and was important in relation to lighthouses. Dr. Russell further stated that the Morse alphabet had been introduced with marked success into Kilmodan Free Church School and South Hall Public School.

Glues and Cements.

The following article translated from *Des Ingenieurs Taschenbuch*, seems to contain, in a small space, a great deal of valuable information which will probably be acceptable to many of our readers.

GLUES.

1. COMMON GLUE.—The absolute strength of a well glued joint is:

	Pounds per square inch. Across the grain, end to end.	With the grain.
Beech	2 133	1,095
Elm	1,436	1,124
Oak	1,735	568
White wood	1,493	341
Maple	1,422	896

It is customary to use from one sixth to one tenth of the above values, to calculate the resistance which surfaces joined with glue can permanently sustain with safety.

2. WATERPROOF GLUE.—Boil eight parts of common glue with about thirty parts of water, until a strong solution is obtained; add four and a half parts of boiled linseed oil, and let the mixture boil two or three minutes, stirring it constantly. (In these directions, and in those that follow, parts by weight are to be taken).

CEMENTS.

1. WATERPROOF CEMENT FOR CAST IRON PIPES, ETC.—Take equal weights, in dry powder, of burnt lime, Roman cement, pipe clay, and loam, and knead the whole with about one sixth the weight of linseed oil. The addition of more Roman cement improves the quality.

2. CEMENT WHICH RESISTS MOISTURE AND HEAT BUT NOT THE DIRECT APPLICATION OF FIRE, FOR GAS AND STEAM PIPES AND SIMILAR PURPOSES.—Two parts of red lead, five parts of white lead, four parts of pipe clay; fine and dry, and work the whole into a stiff mass with boiled linseed oil.

3. RUST CEMENT FOR WATER AND STEAM PIPES, STEAM BOILERS, ETC.—Make a stiff paste with two parts sal ammoniac, thirty-five parts iron borings, one part sulphur, and water, and drive it into the joint with a chisel; or, to two parts of sal ammoniac and one part flowers of sulphur, add sixty parts of iron chips, and mix the whole with water to which one sixth part vinegar or a little sulphuric acid is added. Another cement is made by mixing one hundred parts of bright iron filings or fine chips or borings with one part powdered sal ammoniac, and moistening with urine; when thus prepared, force it into the joint. It will prove serviceable under the action of fire.

4. STOVE CEMENT, FOR THE JOINTS OF IRON STOVES.—Mica, together with finely sifted wood ashes, an equal quantity of finely powdered clay, and a little salt. When required for use, add enough water to make a stiff paste.

5. IRON CEMENT, WHICH IS UNAFFECTED BY RED HEAT.—Four parts iron filings, two parts clay, one part fragment of a Hessian crucible; reduce to the size of rape seed and mix together, working the whole into a stiff paste with a saturated solution of salt. A piece of fire brick can be used instead of the Hessian crucible.

6. CEMENT FOR FASTENING WOOD TO STONE.—Melt together four parts pitch and one part wax, and add four parts brick dust or chalk. It is to be warmed, for use, and applied thinly to the surfaces to be joined.

The Vicissitudes of the Sea.

The steamship Abbotsford recently arrived at New York, 108 days from Antwerp, during which the following mishaps occurred: On reaching one of the southern points of Eng land, the ship stopped for a few minutes to land her pilot, and while so engaged was run into by another steamer, and so badly injured that the vessel had to go to London for repairs. Delay one month. The Abbotsford then continued her voyage to New York, but in mid-ocean, during a heavy gale, her propeller suddenly broke off. This converted her into a sailing vessel. The captain then put back to Queenstown, Ireland. On approaching land, a heavy gale blowing, he signalled for help from another steamer, which, in the effort to connect a hawser, dashed into the Abbotsford, knocking a hole forty feet long, happily above the water line. Through this aperture the water poured in whenever the vessel rolled, until the fore compartment was filled. But at last they reached Queenstown harbor; temporary repairs were made, and tugs employed which took the vessel to Liverpool. Here another month was consumed in repairs, and then another start for New York was made. Heavy gales were encountered, and the passage was long but successful.

Petroleum in Algiers.

A petroleum well, capable of giving a large and paying yield, has recently been discovered in Algiers, near the plain of Cheliff. The substance looks like tar, is soft and very tenaceous, melts in boiling water, and dissolves in turpentine. It burns with a very bright flame, and yields a large variety of products and considerable carbonaceous residue on distillation. It is neither tar, naphtha, bitumen, nor asphalt, but seems to possess the properties of all, in a measure. It has most characteristics in common with naphtha, but, unlike that substance, is almost completely insoluble in alcohol.

Honors to a Young American Lawyer.

The British Social Science Association has lately awarded its first prize of $1,000, for the best essay on international arbitration, to Mr. A. P. Sprague, of Troy, N. Y. Mr. Sprague is a young man of great promise and ability. The essay in question occupied 150 pages.

SCIENTIFIC AND PRACTICAL INFORMATION.

CURE FOR WARTS.

Lisfranc immerses the parts on which the warts are developed in a strong solution of black soap. This causes a slight cauterization of the surface of the wart. The loosened tissue is to be removed and the application repeated every day till the cure is complete. Oil of vitriol should never be used for this purpose; it is very irritating, and inflames the warts instead of curing them.

NEOGENE.

The above name is given by M. Sauvage to a new white alloy composed of copper 57 parts, zinc 27 parts, nickel 12 parts, tin 2 parts, aluminum 0·5 part, and bismuth 0·5 part. It has a silvery appearance, is sonorous, tenacious, malleable, and ductile, and is recommended for jewelry, as a substitute for silver in plate, and for low coinage. The new elements in the combination are those of the bismuth and aluminum. The alloy is very homogeneous, and is susceptible of a high polish.

A NEW SYSTEM OF DREDGING.

M. Bazin, of Angiers, France, proposes to attach, to a steamer with an engine of 60 horse power, two pipes on each side at some 12 feet below the water line. These pipes are to be 10 inches in diameter, about 50 feet in length, and are to be connected to the ship, so as to swing up or down, and also so as readily to yield to the movements of rolling, etc. The extremities of the couple on each side are united by tubes of like diameter, open at the forward end. In clearing out a quicksand, the vessel is got underway at the speed of 8 knots per hour; and on reaching the obstruction, the tubes are lowered with the soft mass. The water pressure above the sand or mud, which of itself would force the material into and up the tubes, is aided by the onward motion of the vessel, and the result is that the mud is driven through the tubes and into the hold. When the vessel is full, the apparatus is raised, and her contents hoisted out or otherwise discharged in some suitable locality. M. Bazin says that, with tubes of the size and with the speed above mentioned, 43,200 cubic feet of mud per hour could be raised. He points out that, in case of their becoming obstructed, the tubes can easily be cleared by simply elevating them out of the mass and allowing the water to rush through them.

Useful Recipes for the Shop, the Household, and the Farm.

The main objection most people have to sending communications on postal cards is that the writing is, of course, open to general perusal. A good way of avoiding this difficulty is to use sympathetic ink. A solution of 10 grains hyposulphite of soda in 16 teaspoonfuls water is the simplest fluid for the purpose. Use a perfectly clean pen, and after writing go over the letters with a smooth paper cutter to remove all traces of the salt. Exposure to the heat of a bright coal fire turns the writing black.

Soluble glass can be made of pure sand 15 parts, charcoal 1 part, and purified potash 10 parts. Mix and heat in a fireproof melting pot for five hours, or until the whole fuses uniformly. Take out the melted mass, and, when cold, powder it and dissolve it in boiling water.

To make pocket mucilage, boil one pound of the best white glue and strain very clear; boil also four ounces of isinglass, and mix the two together; place them in a water bath (glue kettle) with half a pound of white sugar, and evaporate till the liquid is quite thick, when it is to be poured into molds, dried and cut into pieces of convenient size. This immediately dissolves in water and fastens paper very firmly.

A solution of chloride of lime, in water to which a little acetic acid has been added, is among the many receipts recommended to remove ink stains from linen.

Marble can be stained different colors by the following substances: Blue, solution of litmus; green, wax colored with verdigris; yellow, tincture of gamboge or turmeric; red, tincture of alkanet or dragon's blood; crimson, alkanet in turpentine; flesh, wax tinged with turpentine; brown, tincture of logwood; gold, equal parts of verdigris, sal ammoniac, and sulphate of zinc in fine powder.

Mounting fluid for microscopic objects is made of gelatin 1 oz., honey 5 ozs., distilled water 5 ozs., rectified spirit ½ oz., and creosote 6 drops. Filter through fine flannel. Heat the honey before adding to the gelatin, which last must be dissolved in the boiling water. When cool, add the creosote.

Copies of signatures, which may be printed from on a copperplate press, can be made by writing the words and then sprinkling the wet ink with very finely pulverized gum arabic. Make a rim of dough, putty, or similar material, about the writing, and pour in melted fusible alloy of 5 parts bismuth, 3 lead, and 2 tin. This alloy melts at 199° Fah.

To bleach sponge, wash first in weak muriatic acid, then in cold water; soak in weak sulphuric acid, wash in water again, and finally rinse in rose water.

A very good imitation of meerschaum, which may be carved like the genuine article, can be made by peeling common potatoes and macerating them, in water acidulated with eight per cent sulphuric acid, for thirty-six hours. Dry on blotting paper, and for several days on plates of plaster of Paris in hot sand. The potatoes should be strongly compressed while drying.

NEW subscribers to the SCIENTIFIC AMERICAN will hereafter receive the papers from the time of our receiving the order, unless they specify some other date for commencing. All the back numbers from the commencement of the volume (January 1) may be had if requested at the time of sending the order, or on request, after receipt of first number.