

SCIENTIFIC MUSEUM.

A Curiosity.

The Savannah Georgian, of a late date, notices the receipt of beautiful specimens of the date grown by Mr. William Audley Couper, on his place upon St. Simon's Island, Glynn county, Georgia, and which is believed to be one of the first instances in which this fruit has been grown in perfection in this country. The Georgian says:—

The tree bore fruit this year for the first time, and has six or seven bunches, similar to the one now to be seen at our office. Mr. Couper has a number of other trees, but none so old as the one now bearing. The palm-tree which bears the date does not usually bear fruit under the age of thirty years, and it is said that they bear seventy years before they begin to decline. As an article of commerce, the date made into a paste called *adjow* for export, and the oil manufactured and known as palm-oil, form a considerable and valuable article of export. The import of the oil alone into Great Britain, in 1832, amounted to upwards of one-and-a-half-millions of dollars. Why we may not in time raise the date as an article of consumption and export, in the southern part of the United States, Georgia and Florida particularly, will be only because we are too much wedded to the one idea of raising cotton.

Screw Propeller for the Navy.

The London Nautical Standard contains an excellent article on the application of the screw to war vessels, which should receive the marked attention of our Naval Board. It says:—

"Steam is yet in its infancy—the screw is doomed before long to assume the most important place in a naval armament—the paddle is not without its peculiar advantages; and yet who can pronounce either that the one or the other is in such a condition as to satisfy the exigencies of war purposes, or who can deny that there is a wide field open for mechanical improvement in the application of steam as the means of locomotion to ships intended for warlike purposes.

The Board of Admiralty would do well, while the leisure of peace permits them, to calculate calmly the contingencies of the future, to give every encouragement to the contributors of practical improvements in the art of navigation and seamanship, and more especially to that class of men who are the best qualified by their experience to offer suggestions for the improvement and better adaptation of steam as the means of propulsion. The paddle, in its most improved form, can never survive the ordeal of a naval contest; and the screw, although it is open to less objection, is not free from great defects, which would soon become apparent under a severe trial. That the latter instrument must supersede all other means of propulsion is scarcely open to any doubt; it therefore behoves us to lose no time in testing the extent of capability of this important element of power; at the same time ascertaining by what means it may be adapted to ships of war, so as to render it in the greatest degree impregnable in warfare, and that without prejudice to the strength and other necessary qualities of a man of war.

Gold Solder.

MESSRS. EDITORS—I send you a receipt for Gold Solder, which dentists and jewellers will find very valuable; I have been using it several years:—

No. 1—4 parts gold, 3 silver, 1 copper, $\frac{1}{2}$ zinc.
No. 2—3 do 3 do 1 do $\frac{1}{2}$ do.
No. 3—2 do 3 do 1 do $\frac{1}{2}$ do.
No. 4—1 do 1 do 1 do.

It is not as generally known as it should be, that case-hardening may be affected in a minute, or less, by some of the preparations of potash, even better than in an hour by the old process of cementation. I use pounded prussiate of potash and charcoal in about equal quantities, heat the iron to a very low red, wallow it in the pulverized coal and potash, then heat to a cherry red, and chill in water, and the iron will be hardened as deep as by an hour's cementation. The prussiate of potash alone will do, but I think not so well.

By the way, why is it that potash will convert iron into steel? It is generally supposed that it is carbon that effects the change.

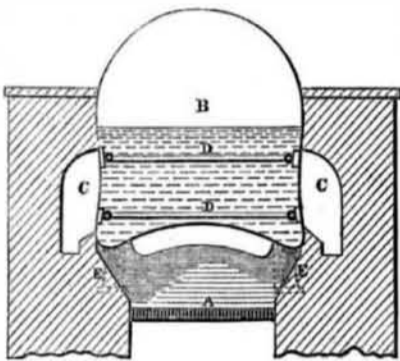
D. J. WELLS.

Bolivar, Tenn., 1851.

[The prussiate of potash is very different from potash—it contains carbon, nitrogen, and potash. It is also well known that cast-iron contains more carbon than wrought-iron. The chemical combinations are only matters of fact; we cannot tell the reason why one substance, in uniting with another, produces a new effect, we only can tell how they act and what they produce, and this knowledge is obtained solely by experiment.—[ED.]

On Boilers.—No. 3.

Fig. 4.



ENLARGING THE FURNACE AND LIGHTENING THE WAGON BOILER.—When a wagon boiler is found to have insufficient power, it frequently admits of a very effectual remedy by lengthening the fire bars; and when the seating walls are unnecessarily thick, by widening the boiler throughout. A great portion of the brickwork on each side may be removed by supporting the boiler on 6 or 8 cast-iron blocks or short columns, and with merely a brick in breadth wall to divide the flame bed and furnace from the side flue.

When this plan is done carefully, it is always followed by a great increase in the evaporating power of the boiler, without requiring any great addition to the area of the fire grate.

A is the furnace; B is the boiler; C C are the flues; D D the braces; E E are cast-iron columns.

In effecting this alteration care must be taken that the enlargement of the fire grate does not injure the draft, otherwise a contrary effect to that expected has sometimes been produced, particularly where the chimney is small and no surplus draft at command. In such a case it is necessary to diminish by a small amount some of the spaces between the grate bars, in order that the total area of draft space may not be increased in so great a proportion as the area of the grate itself. The easiest way to effect this is to chip off one side of the grate, leaving the largest draft spaces towards the centre of the fire; and if there are two lengths of bars, confine the operation to the first length, by which means the combustion will be more rapid where otherwise the coals are apt to accumulate.

It has been already remarked that the evaporating power of a boiler is always found to be, other things remaining the same, in proportion to the area of the fire grate; and to this may be added, the evaporative economy of a boiler is always much increased by any increase of heating surface immediately over or very near the fire, the area of the fire grate itself remaining the same, or in some cases even diminished.

There is another fact connected with this part of the subject which must have struck any one who has been at any considerable pains in making observations, which is, that the heating surface very near to, or over the fire grate is so much more effective than those portions of the boiler which are beyond the occasional reach of the flame, as scarcely to admit of any comparison. Certain, it is, that 2 or 3 square feet of additional surface over the hottest part of the fire grate makes a considerable improvement in the power as well as in the economy of a boiler, while as many square yards of surface added to the contrary end has scarcely any perceptible effect at all, provided that the proportions of the boiler in other respects remain the same. It has been found that when boilers of 20 feet long have been lengthened by 10 feet, the ad-

dition has made scarcely any difference in the evaporating power, while the fire grate remained the same, and the saving of fuel, if any, has only been very trifling.

Gold from Australia.

Accounts from New South Wales to the 18th August have been received in London, giving the most flattering accounts both as to the quantity and quality of the gold round about Bathurst. Sydney was said to be almost deserted. The receipts per week into the town were said to reach £20,000 (\$97,000) to £25,000. The Government armed escort brought £10,000.

The steamer Severn arrived at Southampton the 13th, with the mails from Australia and New Zealand to the 18th August. She brought two packages of diamonds valued at £28,000.

The Sydney News states that gold is most plentiful in Fredrick Valley, and that the gold-diggers are making rich harvests. Lumps of gold, from twelve to fourteen pounds in weight had been found. The Express states that two men in Frederick Valley produced £250 pounds worth of gold in two days. The gold is found in large quartz veins, and an immense quantity has been received at Bathurst. A mail is to run daily between Sydney and Bathurst.

Thus it seems that the produce of Australia gold is getting to be nearly as great as that of California; while diamonds are not unfrequently found. What is to be the end of this? a depreciation of the value of gold. It certainly has that appearance at present.—Well it will do no harm to the world; that is impossible, it will do good. We wish that platina was as plentiful, as it is one of the most useful metals in the arts, perhaps the most useful. The day may not be far distant when every republican will come into the world with a gold spoon in his mouth; this certainly would throw all the patrician class into the shade, as silver spoons only were claimed for them.

What may be Done with Old Rags.

There is a church actually existing, near Bergen, Germany, which can contain nearly one thousand persons. It is circular within, octagonal without. The reliefs outside, and the statues within, the roof, the ceiling, the Corinthian capitals, are all of papier-mache, rendered water-proof by saturation in vitriol, lime-water, whey, or the white of eggs. We have not yet reached that pitch of audacity, in our use of paper, but it should hardly surprise us, inasmuch as we employ the same material in private houses, in steamboats, and in some public buildings, instead of carved decorations and plaster cornices. When Frederick II., of Prussia set up a limited papier-mache manufactory at Berlin, in 1765, he little thought that paper cathedrals might, within a century, spring out of his snuff-boxes, by the sleight-of-hand of advancing art.

Structure on Piles.

Rule for calculating the weight that can be safely trusted upon a pile which is driven for the foundation of a heavy structure. By John Sanders, Bret. Majo U. S. Eng. —

A simple empirical rule, derived from an extensive series of experiments in pile driving, made in establishing the foundation for Fort Delaware, will doubtless prove acceptable to such constructors and builders as may have to resort to the use of piles, without having an opportunity of making similar researches. I believe that full confidence may be placed in the correctness of this rule, but I am not at present prepared to offer a statement of the facts and theory upon which it is founded.

Suppose a pile to be driven until it meets such a uniform resistance as is indicated by slight and nearly equal penetrations, for several successive blows on the ram; and that this is done with a heavy ram, (its weight at least exceeding that of the pile,) made to fall from such a height that the force of its blow will not be spent in merely overcoming the inertia of the pile, but at the same time not from so great a height as to generate a force which would expend itself in crushing the fibres of the head of the pile. In such a case it will be found that the pile will safely bear, without danger of further subsidence, "as many times the weight of the ram, as the dis-

tance which the pile is sunk the last blow, is contained in the distance which the ram falls in making that blow, divided by eight." For example, let us take a practical case in which the ram weighs one ton and falls six feet, and in which the pile is sunk half an inch by the last blow; then as half an inch is contained 144 times in 72 inches, the height the ram falls, if we divide 144 by 8, the quotation obtained, 18 gives the number of tons which may be built with perfect safety, in the form of wall, upon such a pile.

[The above is from the journal of the Franklin Institute; the value and importance of this rule cannot be too highly estimated by our civil engineers.]

Submarine Telegraph.

The newly constructed submarine telegraph between France and England, is about to be put to an important scientific use. Professors Arago, Babinet, and the Abbe Moigne, of Paris, have arranged with Mr. Brett, to open a communication with Professor Airy, to connect the wires on each side of the Channel, with the observatories at Paris and Greenwich, for instantaneous observations. A game of chess, likewise, between four of the most celebrated players in Paris and London, respectively, is about to be undertaken by means of the submarine telegraph.

A Roman mosaic pavement of great beauty has been brought to light at Aumale, one of the French colonies in Algiers. It is a picture of Bacchantes.

Mr. Young, of Manchester, Eng., has succeeded in solidifying gas—a result which Liebig said, some time ago, was "one of the greatest wants of the age."

LITERARY NOTICES.

GRAHAM'S MAGAZINE, for December, is exceedingly well illustrated, and the contributions are of a varied and sterling character. This number closes the volume, and offers a favorable time to subscribe. We wish our friend Graham a large and increased list of paying friends. Dewitt & Davenport are the New York agents.

SARTAIN'S MAGAZINE, for December, has been sent us by Messrs. Dewitt & Davenport. A better magazine than this is not published; the number before us contains several fine and spirited engravings and an able list of contributions. A new volume commences with the next number.

PRACTICAL MODEL CALCULATOR.—We have received No. 4 of this work, edited by Oliver Byrne, and published by Henry Carey Baird, Philadelphia. The contents of this number relate to calculations of the Steam Engine and Boiler; this takes in the locomotive, the nature of steam, strength of materials, the centripetal and centrifugal forces, &c. This work is of great importance to mechanics and engineers.

TO MECHANICS,
Manufacturers, and Inventors.SEVENTH VOLUME OF THE
SCIENTIFIC AMERICAN.

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