



Fabulous Walled Lake in Iowa.

MESSRS. EDITORS:—Having read an article some three years since, in regard to a wonderful walled lake in Wright county, Iowa, which I see repeatedly published lately, I wish to give you the facts in regard to it, which I am prepared to do from personal observation. Having occasion to visit that part of the State in 1860, I made inquiries of "the oldest inhabitants" of Clear Lake City (on the beautiful Clear Lake of Cerro Gordo county, some forty miles from Wall Lake) in regard to it, and they smiled at the *sell*. But in traveling from that point to Fort Dodge, I went some twenty-four miles from the direct route to see for myself the wonders of Wall Lake. I passed along its banks far enough to bring the whole shore in distinct view, and could discover nothing in the least remarkable from what is frequently to be found in the lakes of that region, or what could easily be accounted for by those who are familiar with the action of the ice on the shores of those northern lakes. The writer of said article, I presume, was nearly correct in regard to its area; but its shape is rather irregular and the wall is broken and uneven; in many places it entirely disappears in a sand and gravel beach. In no spot could I discover anything more than a low and irregular line of pebbles and boulders intermixed with earth, from two to six feet in height, which had evidently been shoved up by the expansion of ice. In parts where there was not sufficient coarse stone or boulders to retain the earth and gravel, the action of the water during the summer would wash down the work of the winter's frost, and leave a beautiful beach from the margin up to the alluvial soil, which is from two to ten feet above the water. I have seen walls in every respect similar on other lakes of that region, which seem to be composed of drift and lost rock which abound in that vicinity.

This ice action is quite considerable and remarkable in these extensive lakes; it frequently forms to the depth of two feet or more, and the expansion of a mile or so of surface acts with great force on the banks, lifting up large masses of frozen earth and boulders weighing tons and shoving them several feet from the shore, and during very sudden and severe changes its motion is often perceptible to the eye.

This walled lake seemed to be shallow, as the most of its surface was shaded with a growth of flags and rushes; it also appeared to be the paradise of ducks and geese; it might just as properly be termed a large goose-pond as a lake. I discovered no apparent outlet and saw no indications of its overflow or change of level. G. W. BELL.

Croton, Mich., Nov. 24, 1862.

Gun Cotton and Gunpowder.

MESSRS. EDITORS:—In the SCIENTIFIC AMERICAN of Nov. 29th, I observe that Professor Seely stated, at the Polytechnic Association, that "If some gun cotton is pulled out loosely, and some powder sprinkled on it and a match is applied to it, the cotton will burn without setting the powder on fire. This is owing to the fact of its burning with a flame in which the heat is not intense." This broad statement, if not fully explained, might lead to very unhappy results. Take grain powder and bruise it, place it over or under gun cotton, fire the cotton, and the gunpowder explodes. The very fine particles of powder being unpolished, the heat is more readily absorbed. As common gunpowder is a very poor conductor of heat, and the flame is of low intensity and short duration, the grains are only surface heated, and of low temperature. But the finer particles of powder are, to use a very unphilosophical phrase, "all surface together," and each has an atmosphere which tends for the time being to cause the particles to retain a high temperature and thus explode.

Take the very fine shavings of gutta-percha, and pour on them, in a glass vessel, equal parts of nitric and sulphuric acid; the gum and acid will respectively decompose each other, and give off the strong fumes

of musk. By this means artificial musk might be obtained. Thick pieces of this gum are readily dissolved thus by using a little heat. In our standard works, European and American, it is stated that gutta-percha is acid-proof; you may indeed boil it in common nitric and nitro-muriatic acid, and but little change is effected.

While I am in the way of criticizing, allow me also to say (in relation to an excellent article that appeared in the SCIENTIFIC AMERICAN on the bleaching of engravings, from the pen of a Boston professor) that the best mode of using chlorine is to use it free of lime in water. Lime is more soluble in cold water than hot. The chloride of lime and water will always deposit a little lime on an engraving, and to an "expert" the dark parts will have a gray appearance. Pure chlorine and water (soft) should be kept in the dark, for light will decompose the water, and then weak muriatic acid will be formed. Chemists in England have it for sale free of lime for this express purpose.

THOMAS TAYLOR.

Washington, D. C., Nov. 29, 1862.

Moist Sensitive Photographic Plates.

MESSRS. EDITORS:—It has long been an object with photographers to keep prepared sensitive plates moist longer than ordinary, as it is well-known that in a dry atmosphere, in doors or out, a sensitive plate will crystallize in a few minutes and be rendered unfit for use. My remedy is this:—Take newly-made plate frames and varnish them with gum shellac dissolved in alcohol, until the wood is thoroughly saturated; after being dried, immerse them in water for an hour, take them out, drain and wrap them in a wet towel, and place them in a box made of wood or leather with a close lid. The towel should be wet daily and the frames kept in the box. By these means, with a nitrate bath of thirty to thirty-five grains, I have no difficulty in keeping the plates two or three hours or more. I have had many inquiries about my process, upon the supposition that there was some secret in the preparation of the plate; but it consists in preventing the evaporation of the moisture, and that is effectually done by the above method. F. W.

Petroleum for Oil-stones.

MESSRS. EDITORS:—I have an old stone very much soaked and gummed up with oil, so much so that my plane iron would slip over it without sharpening. I took to using petroleum oil on the stone, and it seems to work first-rate. It draws the oil out of the stone, and has a tendency to make the iron or chisel cling to it, which greatly facilitates the whetting.

C. G. AUSTIN.

The New Metal, Thallium.

Mr. Crookes, the discoverer of this new metal, gives the following description of it in the Proceedings of the Royal Society:—"Thallium in the pure state is a heavy metal, bearing a remarkable resemblance to lead in its physical properties. Its specific gravity is, however, higher—about 12. The freshly scraped surface has a brilliant metallic luster not quite so blue in color as lead, and it tarnishes more rapidly than this latter metal. It is very soft, being readily cut with a knife and indented with the nail; it may also be hammered out and drawn into wire, but has not much tenacity in this form. It easily marks paper. The fusing point is below redness, and with care several pieces may be melted together and cast into one lump. There is, however, generally a loss in this operation, owing to its rapid oxydation. The metal itself does not appear to be sensibly volatile below a red heat. I have made no special attempts at present to determine the atomic weight, although from two estimations of the amount of sulphur in the sulphide it appears to be very heavy. The figures obtained did not, however, agree well enough to enable me to speak more definitely on this point than that I believe it to be above 100. I may mention that I obtained this element in the pure metallic state and exhibited it to several friends as early as January last, and should then have published an account of it, had it not been for the reasons already mentioned. Thallium is soluble in nitric, hydrochloric, and sulphuric acids, the former attacking it with greatest energy, with evolution of red vapors."

Preservation of Wood by Charring.

M. Lapparent, of France, who has published a most interesting essay on the preservation of ship timber, proposes to char its surface as the most effectual way of securing it from rot for a long period. He says:—

By charring timber the surface is subjected to a considerable heat, the primary effect of which is to exhaust the sap of the epidermis, and to dry up the fermenting principles; in the second place, below the outside layer, completely carbonized, a scorched surface is found—that is to say, partly distilled, and impregnated with the products of that distillation, which are creosoted and empyreumatic, the antiseptic properties of which are well known. A bench, the legs of which had originally been charred to the depth of 19 inches, after remaining in the ground eighteen years, near a pond, was dug up, and found to be in such good preservation that it was difficult to get the point of a knife into the extreme end of one of the legs. On the other hand, vine-props of oak, driven into the dry soil close by, were rotten in one year. M. Lapparent's method, which is about to be applied to all the dockyards of the French empire, is to char by means of a strong jet of inflammable gas. A workman, in an average day's work of ten hours, would carbonize a surface of 440 square feet, and the expense would be three cents per 10 square feet. A little tar smeared over the surface facilitates the process, and prevents the timber from being too suddenly effected by the heat of the gas. But more than a mere thin coat of tar would do harm. In ship-building, gas-charring should be applied to every surface likely to be in contact with moist or stagnant air. In house-building, it should be applied to the beams and joists embedded in the walls or surrounded with plaster; to the joists of stables, cow-houses and laundries, which are affected by a warm, moist atmosphere; and to the wainscoting of ground-floors. For railway-sleepers, charred timber, when scraped, can be painted any color.

A New Nail-making Machine.

To the numerous features of interest contained in the machinery annexe, at the London International Exhibition, has lately been added a wonderful machine for making nails, the invention of Mr. C. Gustafson, a Swede. Iron nails hitherto used have either been forged or cut by machinery from sheet iron or iron wire. Nails thus made are necessarily costly; the first named by reason of the slowness of the manufacture, and the two latter by using too expensive material. This new machine supersedes all others by combining in itself the process of rolling, pointing, cutting off, and heading; and produces from bar iron an excellent nail at a very low cost. The rapidity with which the nails are produced by this invention is truly marvelous. Using bar iron three-eighths of an inch square, the machine, with the labor of only one man or even a boy, will turn out in a day of ten hours as many as 15,000 three-inch nails. The nails produced are of the very highest quality, being compressed by the rolling process, and always having the grain of the metal in the direction of the length. They are formed with fluted sides, which is the most advantageous of all forms, but very expensive to produce by any other process hitherto resorted to. By slightly altering and re-adjusting certain parts of the machine different sizes and forms may be produced. In working iron, the bars are heated red hot in a small furnace placed at the side of the machine; but as no fire is allowed in the exhibition building, the machine can only be shown working such metal as can be worked cold. The practical efficacy of these machines is placed beyond all doubt from the fact that they have been tested by the experience of two years' constant work.

WHILE the *Monitor* was at Washington for repairs, her turret was found uninjured. Over the indentations on the turret, received at the engagement with the *Merrimac*, has been inscribed the name of the engagement, punched into the iron. She has now gone forth to future conquests, and her sides may hereafter be inscribed all over with the records of her victories.

VALUABLE iron mines have recently been discovered in Aroostook county, Maine, by those engaged in the geological survey.