

INDELIBLE WRITING.

A paper was lately read on the above named subject, before the Scottish Society of Arts, by D. R. Brown. He defined indelible writing not to mean "indestructible" writing, for that is an impossibility, but it means writing which will endure for an indefinite period of time, and also resist known chemical agents to obliterate it without destroying the paper or parchment upon which it is written.

Old writings are very permanent. An examination of these reveals the fact that they have been produced by that wonderful substance carbon. The ruins of Assyria, Egypt and Greece, unite in giving up the black carbon which the old writers used in their calligraphy. Three thousand years have passed away since some of these writings were made, and the graves of the authors are unknown, but these carbon sketches tell us what the people on the earth then did, and what they thought. Scientific men of the present day justify the use of carbon as the most indestructible writing agent, but to apply it properly it must be combined with the paper in such a manner that it will constitute an integral part of it, incapable of removal without destroying the paper.

As all paper contains carbon, it occurred to Mr. Brown that by using a platina wire made red hot by galvanism, he could use this for a pen by tracing it upon the paper, and thus develop by burning, the charcoal in the paper itself to form the writing. The first attempt to develop this idea was a failure. When the hot platina wire was moved quickly upon the paper, it burnt through it. Thicker paper imbued with various vegetable substances were then tried, but failure attended these also. Tin foil was laid upon sheets of paper, and written upon with the platina wire; it left engraved writing upon the paper, as the foil was melted out. Brown paper having produced better writing than white, various thicknesses and different kinds of it were tried, and with one particular quality very natural and perfectly indelible writing was produced. This was due to a very minute portion of tar left in the paper. The color of the paper is objectionable, but it possesses qualities of a very useful character, it being obnoxious to insects, and not liable to be affected with damp or mold.

Great difficulty was experienced in using the galvanic pen, as the wire bent frequently, and the galvanic battery was not regular in its action. From the use of heat and a mechanical agent, the attention of Mr. Brown was directed to chemical agents to set the carbon in the paper free. Two powerful substances were tried, namely, a solution of phosphorus in bisulphuret of carbon, and strong sulphuric acid. The solution of phosphorus was found to be too energetic as a small stream of it ($\frac{1}{10}$ th of an inch) ejected from a fine tube, made deep black lines a quarter of an inch broad, and it penetrated through thick paper. It was therefore considered an impracticable substance. The sulphuric acid was next tried by writing with a fine tube. When written upon thick brown paper, and half an hour allowed to elapse, and the paper then held near a clear fire for about two seconds, deep black writing appeared. The sheet thus written upon was washed in water, aqua-potassa, nitric acid, and chlorine water, without effacing the writing. When put into the milk of bleaching powder (chloride of lime) however, the black writing disappeared, leaving clear cut lines in the paper resembling those made with a sharp-pointed instrument. The sulphuric acid may thus be employed to etch upon paper, and castings may be obtained from it. This hint may be useful to artists.

The result of Mr. Brown's experiments go to prove that he has not found a true indelible ink. Sulphuric acid has long been known to possess the power of charring white paper when exposed to a slight heat, and we have used it several times in the condition of a free sulphate of indigo for writing with upon white paper, but in every case it burned the paper, and, besides, it is unsafe to use. The old ink used by the Egyptians and Greeks was the very same kind as that employed at the present day by the Chinese, and which we call Chinese ink. It is formed into cakes, and is composed of the black or condensed smoke of camphor mixed with isinglass, and then dried. The camphor is burned and the smoke is caught by exposing a plate above the flame. The smoke adheres to the surface and is really very fine charcoal or carbon,

A Chinese scribe carries his "ink-horn" at his girdle and when his ink fails, he replenishes the bottle by grinding a stick of the "camphor-black" in water. This is a very permanent ink, but it does not flow so freely from the pen as the common inks now used, which are made of logwood, nut-galls, and the sulphate of iron. The facilities which all civilized nations now enjoy for printing, obviates the necessity which formerly existed for an indelible writing fluid, because the pen was the only printer known to the Greeks. Printer's ink is chiefly composed of carbon, the indelible agent used in the old writing inks.

IRON PLATING--IS THE WARRIOR A FAILURE?

In recent news from Europe it is stated that the famed iron-clad frigate *Warrior*, on a late passage from England to Lisbon, Portugal, excited the apprehensions of all on board by "laboring badly in the sea." The waves washed over the decks as she lay like a log in the water, "the cabins were flooded, and in nine cases out of ten she would not obey the helm." Such statements are quite contrary in their nature to the glowing descriptions which were published respecting the *Warrior's* trial trip in Stokes's Bay, in the month of October last. On that occasion she attained an average speed of sixteen and a half miles per hour, and she was said to be the swiftest as well as the strongest war vessel ever built. It was once proposed to send her to America, and the *London Times* even threatened to have her sent into the Hudson river, and thus demand terms in the face of New York and Hoboken. From the accounts that have reached us we may now feel certain that New York and Hoboken are safe.

Before her voyage to Lisbon the *Warrior* made a trip from Chatham to Portsmouth, and in this brief voyage, it is stated, she betrayed decidedly defective qualities. In alluding to one of these the *London Times* says;—

One serious defect, of an almost if not quite irremediable character, exists in the construction of iron-cased ships as constructed at present, and is fully exemplified in both the *Warrior* and *Black Prince*. This evil is the penetration of water between the teak and armor plates. This water naturally forces for its exit a passage between the joints of the armor plates; and the opinion at present is, that nothing can remedy this under the circumstances of tongued and grooved edged plates hung on a ship's sides by through bolts. Caulking is stated to be useless, and that cannot be wondered at, considering the slung weight to be dealt with and the ship's motion at sea. But the effect of the action of the water in the grooves of the plates and upon the iron bolts can only be expected to be such that in four or five years from the time of commission each ship will require replating.

If the *Warrior* had proved to be a good and safe sea-going steamer in her voyage to Lisbon, the peculiar defect in the plates alluded to by the *Times* could be easily avoided in the construction of other iron-clad frigates. The plates of this vessel are tongued and grooved like pine planking for floors. This work was executed at great expense with the object of securing perfectly tight seams when the plates were fastened to the wooden planking inside. The matching of the plates by tonguing and grooving, reduced their strength about one-third at the seams, and was therefore objectionable on this account. But the most unfavorable sign of the utility of such a heavy iron frigate is its defective sea-going qualities. Of course these remarks are based upon common reports, and they may be greatly modified when the circumstances are more fully explained.

The defects of the *Warrior* should not be urged against the utility of iron plates for war vessels. Our Western gunboats have fully demonstrated the great benefits arising from iron plates of moderate thickness. In addition to the information which we gave in the last issue of the *SCIENTIFIC AMERICAN*, the *St. Louis Democrat* states that the plating of the flag boat *Cincinnati* was very efficient. In the attack upon Fort Henry one of the largest shot struck the iron-clad wheel house, producing a fearful concussion, but it only indented the plates and did no further harm.

Operations of the Confederate Patent Office.

The *Richmond Dispatch* of the 11th Feb. says:—

We have a copy of the report of Rufus R. Rhodes, Esq., Commissioner of Patents, giving a history of the operations of the office under his control, and showing its condition on the 1st of January, 1862, from which we make up the following brief summary: Number of applications for patents during the past year, 304; caveats, 110; patents issued, 57; United States patents and assignments thereof recorded, 112; amount of fees received, \$9,000 90; amount of expenditures, \$6,188 28; excess of receipts over expenditures, \$2,812 62. The patents issued were distributed

among the several States thus: To citizens of Virginia, 15; Georgia, 9; Alabama, 7; Louisiana, 6; North Carolina, 5; South Carolina, 4; Mississippi, 4; Tennessee, 3; Arkansas, 2; Florida, 1; Texas, 1. Eighteen of the patents that have been allowed cover improvements in firearms, or other destructive implements of war, and with the view of showing that some of them have striking merit the Commissioner points to the fact that they have been adopted by the Government for use against the enemy, after trial, in preference to inventions of a similar character, which, originating in foreign countries, have received there the highest approval of scientific and military men. A considerable proportion of the mechanical improvements for which patents are sought relate to agricultural implements. It is also noted, as an illustration of the inventive genius of the South, called into action by a desire to aid the common cause, that a village schoolmaster in the State of Arkansas, has received a patent for an instrument for measuring distances without the use of logarithms or other difficult process of calculation, which, if it but fulfill the expectations of the inventor, is likely to be of immediate practical value in the adjustment of artillery to different ranges, whether in fixed batteries or in service in the field. The Commissioner is informed that the instrument is soon to be tested with guns at Nashville, and there are strong grounds for believing it will prove a complete success.

The excess of receipts over expenditures sufficiently demonstrates that the office is most prosperous in its financial department, and that it is entirely self-sustaining. The report makes various suggestions concerning the administration of the office, as well as some changes in the Patent laws, which, we presume, will receive the early attention of Congress.

It appears from the above summary of Commissioner Rhodes's report of the doings of the Confederate Patent Office, for the past year that but 304 applications were made during the whole year, which is rather a poor exhibit when the fact is taken into consideration that many of the cases were mere re-applications for patents, which were previously granted to Southern inventors by the United States government.

Lords and Locomotives.

Recently a case was tried in England in which a writ of insanity was applied for by General Windham with other rich noblemen, his relatives, against his nephew a wealthy Windham, whom they thought had rather degraded the family by marrying a girl of lower rank, and who was also in the habit of doing things very peculiar, unbecoming his high blood. One of these things was sometimes driving a locomotive, and this formed one of the specifications respecting his sanity. The case has been terminated in favor of the young Windham, and the following is the evidence of Lord Claude Hamilton, M. P., whom he obtained for one of his witnesses on the locomotive question:—

I do not consider a taste for driving railway engines a proof of insanity, and such is the opinion of many who hold a distinguished rank in society. Many years ago I joined with half-a-dozen others in studying the great motive power of modern times. We attended a course of lectures at the Polytechnic, and went into the matter as thoroughly as we could. After a time we were allowed, under proper supervision, to drive engines on railways. I must say, however, that we were not permitted to experiment with passenger trains, but were restricted to ballast and coke trains. I can assure you that it requires a good deal of skill, self-possession, coolness of head and delicacy of touch to drive a railway engine. It is decidedly an intellectual study."

More Culpable Loss of Army Horses.

In addition to the large number of horses which were lost by the improper method of placing them on shipboard, as stated by us on page 105, current volume of this paper, the *Boston Bulletin* states that 143 horses have since been killed, out of 200 shipped in the *Black Prince* to Ship Island. They had been packed on board by Col. George in pens containing ten each. These horses cost \$143 each, and thus the loss to the government, in this single case, is no less than \$17,875. The treatment of horses purchased for the army demands a thorough investigation.

At a late meeting of the Franklin Institute, Philadelphia, Mr. Howson exhibited some remnants of a rifle barrel, to illustrate the results of a recent dangerous experiment. The barrel was filled with cartridges, each cartridge consisting of a ball with a charge of powder, and each ball having a hole through it for the reception of a fuse. The supposition was, that after igniting the powder of the first charge, a short time would elapse before the explosion of the next charge. On igniting the first cartridge, however, the whole exploded, and broke the barrel into a thousand pieces.