

riculturists who are interested in ditching, and have large wet meadows or prairie lands which require ditching and cheap fencing.

More information may be obtained by letter addressed to the patentee, at Jackson, Mich.

MISCELLANEOUS.

The Philadelphia Mint—Refining Gold—Its Troubles and Trials.

On page 29, this Vol. "Scientific American," we briefly reviewed a pamphlet by R. S. Culloh, late Metal Refiner at the Mint at Philadelphia, now of Princeton, N. J. An answer to that pamphlet has been published and is now before us, by the present Melter and Refiner, James C. Booth. The pamphlet is a letter to our now ex-President Fillmore, and we have been requested to peruse, and notice it, and in courtesy we will do so. The letter of Prof. Booth, is remarkably temperate in language and we like the spirit which pervades it.

The historical origin of the transaction in question may be thus briefly stated from Prof. Booth's publication. Prof. McCulloh was melter and refiner at the U. S. Mint, at Philadelphia, for some time prior to Dec., 1849; before which period he had invented a new process for refining gold, in regard to which he took the preliminary step for a patent within a few days after his accounts at the Mint had been closed. He was succeeded in his office by Prof. Booth, who, in attempts to improve the methods actually in use, fell, as he says, upon one which turned out to be the same with that earlier invented by Prof. McC., and which, though characterized by remarkable facility in the earlier stages, presented extreme difficulty in the lamination, afterwards, of the gold refined by it. Prof. Booth was thus induced to devise another process, for which, in August, he, in conjunction with Prof. Morfit, now of Baltimore, also took out a patent. As neither of the processes had been experimentally tried on a sufficiently large scale, and as the parties, up to this time at least, appear to have had mutual confidence in one another's learning, skill, and fairness, they concluded to join their interests in the two patents, and subsequently procured an appropriation from Congress of \$25,000 for the purchase of that one which, upon fair trial at the Mint in Philadelphia, should prove to be the better. The experiments for determining this question were made in the last part of 1850 and first month of 1851, under the instructions of the then Director of the mint (Dr. R. M. Patterson) and by Prof. Booth, who, having succeeded in overcoming the brittleness of the metal that had before resulted under the McCulloh process, recommended that process for adoption at the Philadelphia Mint, where the establishment was ample and regular, and the other—the Booth and Morfit process—for adoption in California as being the cheapest and most flexible and best adapted for extemporized and less extensive mints.

But so far, these experimental tests related to the quality of the metal and the quantity of it that could be refined in a given time. And before the recommendation of the McC. process was adopted, the Director ordered that another very important particular—the relative waste of gold, under the several processes,—should be observed. These observations are stated to have been in fact made by the Director himself and to have proved unfavorable, by showing a greater waste in the McCulloh than in the old or Mint process, with this result before him, in spite of the recommendation of Prof. Booth, in other respects Dr. Patterson disapproved the introduction of the McC. process into the Mint.

Prof. McC. was naturally dissatisfied with this issue, proposed and with the consent of Prof. B. procured a dissolution of the partnership which had existed in the two patents; and founded upon the circumstances attending the events which we have thus briefly sketched, grave complaints and charges against Prof. B. in particular. These charges were formally laid in the Treasury Department, from which they were duly referred, in the latter part of 1851, to the then Director of the Mint—Dr. Eckert, successor to Dr. Patterson—for

investigation. The Director reported them back as unsustainable. Subsequently, the Treasury Department authorized Prof. McC. to apply his process himself within the walls of the Mint at Philadelphia, as he did, on April 1, 1852, upon about a quarter million of gold, but in result showing more waste than the ordinary Mint process, the Director disapproved the introduction of the new method. To this disapproval, Prof. McC. takes exception; and in a printed letter to Mr. Corwin, in August, 1852, states his exceptions and renews the charges against Prof. B. We understand the pamphlet of Prof. B. is a reply to the original and to the renewed charges.

The charges thus replied to may be assembled in three groups; according to their purely personal, their official and their mixed character.

To the first of these belongs the allegation of disingenuousness at the time of the formation of the partnership. Prof. B. declares that he assented to the partnership originally at Prof. Culloh's suggestion and acquiesced in its dissolution at Prof. McC.'s request.

The second group of charges are those which affect the official relation and standing of the Melter and Refiner at the Mint, and amount to a general allegation of unskillfulness and neglect of duty. Without taking up the minute and particular answers of Prof. B., which we have not room to enumerate, it is sufficient to say that he refers to the evidence of two successive Directors of the Mint. On this point, Prof. B.'s pamphlet furnishes some very interesting statistics, which of course we accept as authentic and reliable. From these we have reduced the following table of deposits of Gold at the U. S. Mint per month.

McCulloh Refiner—

| | Least amount. | Greatest. | Average. |
|----------------|---------------|-----------|-----------|
| 1849 | 30,000 | 793,000 | 404,200 |
| Booth Refiner— | | | |
| 1849 | 747,000 | 1,669,000 | 1,208,000 |
| 1850 | 1,005,000 | 4,579,000 | 2,660,750 |
| 1851 | 2,818,000 | 5,577,000 | 3,977,333 |

With these results before us, which show an amount of work for Prof. B. nearly ten times as great as Prof. McC. was used to—indeed an amount that we believe is quite correct in saying to be unprecedented in the annals of minting.

It is true that the existence of a large bullion fund might be significantly connected with this silence of depositors, who being paid out of such a fund directly, the value of their deposits is ascertained by assay and weighing, have no reason for concern with the subsequent management of what they have deposited and sold. But according to Prof. B.'s statistics, the bullion fund of 1849, in Prof. McCulloh's time, was \$1,000,000, when the average monthly deposit was \$404,200 and the ratio, therefore, of the amount kept on hand to meet payments to the amount required to be paid, was very nearly $2\frac{1}{2}$ to 1. The same fund now is \$4,000,000, and the average monthly deposits as much, showing a ratio of equality between the fund and deposits, or of 1 to 1. This may be plainer in the following account:—

In 1849, McCulloh, Refiner, monthly average deposits, 400,000; constant bullion fund, 1,000,000; ratio—deposits 1, bullion $2\frac{1}{2}$.

In 1851, Booth, Refiner, monthly average deposits, 4,000,000; constant bullion fund, 4,000,000; ratio—deposits 1, bullion 1.

It is obvious that, with prompt payments, there must be a bullion fund whose amount, other things being equal, must vary in proportion to the amount of deposits in a given time. All that skill can do, is, in the rapid melting and refining of these deposits and the replacement of the bullion fund to lessen this proportion. Whether Prof. B. has reached the utmost limit in this respect, cannot of course be appraised; but under his management progress has been made towards it; and in taking off 60 per cent. of the unfavorable proportion that existed before he certainly cannot be held to manifest want of skill.

In another important particular relating to the economy of his management, and which is of interest to the government, just as the diminution of the bullion fund is, viz., the waste in the meltings, Prof. B. exhibits a similar improvement, as shown by the following table:—

| | Oz. melted. | Oz. wasted. | Loss. |
|--------------------|-------------|-------------|--------|
| McCulloh, Refiner— | | | |
| 1849 | 673,000 | 239 | 00035+ |
| Booth, Refiner— | | | |
| 1850 | 3,000,000 | 689 | 00022+ |
| 1851 | 2,555,000 | 635 | 00025— |
| 1852 | 5,074,000 | 1,247 | 00025— |

The weights have been given here only to the nearest thousand ounces; in the pamphlet they are set down to the nearest ounce. The quantities in the last column result from the exact numbers; the sign + showing that the quotient is too small, and the sign — that it too high. They show a diminution of waste effected by Prof. Booth of 1-10000th, and a saving of that extent over the results of his predecessor. Had the waste admitted by Prof. McC., during the latter part of his management, been allowed to continue by Prof. B., the dead loss would have been, up to Aug. 1852, more than 1000 ounces, or upwards of 18000 dollars, for the saving of which Prof. B. may undoubtedly claim credit.

Again, in the earliest practice of refining gold by the nitric acid process, 3 lbs. of silver were alloyed with 1 lb. of gold, in order to effect the subsequent parting of the latter; from which proportions, the fine gold being a quarter of the alloy, we still have the term *quartation*, although it has ceased to be significant. Later improvements allowed the use of $2\frac{1}{2}$ lbs. silver to 1 lb. gold, which was the proportion habitually employed by Prof. McCulloh in the U. S. Mint. Prof. B. avers that he requires but 2 lb. silver to 1 lb. gold, thus sparing 1-5 of the silver formerly used. It is probable that, in this respect he has reached the utmost limit of economy; but whether or no he has certainly lessened the room for reproach in thus economizing upon the costly materials required even by his immediate predecessor.

The last group of charges to be referred to, affect at once the official and individual character of the party, and include allegation of fraud or clumsiness in the trials made by Prof. B., at the Mint, of Prof. McC.'s new process. To us it appears that a charge on this account is not happily nor reasonably made by the latter; for the issue of those trials was a direct and positive recommendation of the said process for exclusive employment at the Mint in Philadelphia. Whether the trials, then, were fairly and skillfully or dishonestly and awkwardly made, Prof. McCulloh, inasmuch as he obtained a favorable verdict, is hardly the person to be heard in complaint. Other persons, we ourselves for instance, might express our surprise that so emphatic a recommendation should have been given before one of the most important considerations—the waste—had been weighed; but not the party whose interest was in the way of being subserved by the premature recommendation. But however this may be it appears that Prof. McC. had and used the opportunity of nearly three months' trial of his own process under his own direction at the Mint, without succeeding in convincing the Director that it is preferable to the one habitually employed. Now, it may be that the Director was unduly difficult to convince, but it is reasonable to say that all defects whatever in Prof. B.'s trials were cured by the actual intervention of the party devising, and therefore most interested and best knowing how to carry out his own process.

The cause of our remarks has led us now to the merits of the processes which have given rise to the pamphlet in question: a subject which, in the beginning, we hinted our intention of not discussing, for it is our opinion that there are better ways than have been so far adopted for preventing or quieting the discords of which we have been treating, and which neither helps science herself nor her votaries. That it may not be supposed we were using random phrases or dealing in unreflected generalities, we conclude this notice with what seems to us a practical suggestion:—Let a commission of three (or any multiple of three) persons sufficiently distinguished by their knowledge of the subjects, be constituted under the authority of the Treasury Department, whose functions shall be to superintend at some fitting time, and upon a suitable scale at the Philadelphia Mint, full and fair trials, of the proposed new pro-

cesses, so as to set at rest, once and for all the questions that have been raised; in whose discussion the public can hardly be expected to take interest further than as they affect the vindication and, if requisite, the amelioration of the Mint establishment, whose integrity and judicious administration ought to be, for the credit of the government of our country, above suspicion.

Buried Alive.

Galignani gives a thrilling account of two men and a boy being buried six days and six nights, in a marl pit at Ecretville, in the department of the Seine Inferieure, who were finally rescued alive. During the whole of that time they were without food, without light, and almost without clothes; and they were in such a confined place, that with the exception of the boy, they could not stand upright. Boitard, the eldest man, declares that during the whole time he did not sleep more than two hours; but his companions, and especially the youngest one, more. They slept back to back. They felt no hunger and Boitard says that even if they had provisions, they would not have touched them; but they experienced great thirst. On the fourth day they found a little water, thick with marl, by digging into the bottom of the pit. It was this water, probably, which preserved their strength. At first they heard the noise of the pickaxes and spades above them; but during the last three days their breathing was so loud as to prevent it from reaching them, and this circumstance naturally increased their agony of mind; they also feared the miners were digging in a wrong direction. One of them had about 50 chemical matches and a small piece of candle; but though they often tried, they could not, for want of air, cause the candle to burn. During the latter part of the time they became so exhausted as to be unconscious of their position; but the boy once cried as if in a dream, "There is the rope, Boitard! Let us ascend!" One moment and a breath of air rescued them, they fainted, but after a while they recovered.

(For the Scientific American.) Dust from Stoves.

As a subject for improvement in stoves—parlor, cooking, or any other description, let me suggest to our inventors and patentees, the remedy of one serious detriment which has invariably been overlooked up to the present hour—that is, a mode, plan, or adaptation of carrying off the dust when it is raked so that it shall not spread over the room, covering every thing with ashes—that is, dust; to me, and I should suppose to every one, it is a matter of serious inconvenience.

The remedy I propose is to have an aperture under the grating leading to a pipe-way communicating with the usual pipe attached to all stoves, this aperture to have a sliding door, to be opened when the fire is raked, and closed all other times, unless desired to check the draught; this method—something like which I have seen in the brick settings of grates in England, would produce the great advantage of carrying the ash-dust up the chimney and not over the room, furniture, or occupants. This mode could be easily adopted in our new castings, running up behind the back stove plate, and into the pipe, and would be a universal benefit to our families and housekeepers in general, and to none more so than to
Yours, &c.,
A SUFFERER.

Patent Case.

On the 12th inst., in this city, before Judge Nelson, a patent case was decided for the infringement of a patent for the manufacturing of cotton batting, Hamilton B. Lawton et al. agt. Russell B. Stebbins et al. The plaintiffs alleged that defendants infringed their patent for a machine for manufacturing batting, they having manufactured and sold 1,000,000 lbs. of batting, made on their plan. The amount of damages claimed was \$10,000. A verdict was granted for \$1,235.

The Floating Battery.

Preparations for constructing the proposed floating battery for the United States Government, designated for harbor defence, are actively going forward at Hoboken, by Robert L. Stevens, the contractor.