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The New Metal, Aluminum.

When in 1807, Humphrey Davy applied the galvanic current to a piece of moistened potash, and produced therefrom the peculiar metal, "potassium," chemistry passed with a single leap from a narrow into a boundless circle. People were astonished at the discovery of metal in a substance which had long been employed for making soap, and which was obtained from the ashes of the very wood used for heating their rooms and boiling their kettles. On the heels of this, there followed the no less memorable discovery of the metal "sodium," in the very salt used for seasoning food, and the lime used for making mortar; in short, it was made evident by Davy that much of the materials of our globe, previously known as "earthy substances," were nothing less than the rust of various metals. Among the various earths, few would have thought that common clay, used for making bricks and puddling embankments, contained a metal; but, like potash, soda, and lime, it was submitted to the *experimentum crucis* by Wohler, and gave up its secret, also. It was found to be the oxyd of the metal "aluminum." This is the metal which has recently been brought so prominently before the public, in France, by M. Deville, as noticed by us in our last volume. Although its existence has been known for many years, still it never was obtained before, except in a spongy, and very subdivided state, and it really may be called "a new metal," so far as its application to the arts is concerned.

Its properties are peculiar. It is two and a half times heavier than water, only one-eighth that of platinum, and one-third that of iron, so that it is exceedingly light. It is white, like silver, but has a slightly bluish tinge. It is malleable, and very ductile; it can be drawn out into the finest wire, or beaten into the thinnest plate, and in this respect it resembles gold. It is a superior conductor of electricity, and is stated to surpass copper in this respect. The melting point of it is a little higher than that of zinc; it does not easily oxydize; water appears to exert no action upon it, and it is nearly unalterable in the atmosphere. It appears to hold a position between the precious metals—platinum, gold, and silver—and the common ones—iron, copper, lead, and zinc. Its chemical properties are, therefore, invaluable, and if it could be produced in large quantities, and at a moderate price, it would revolutionize the arts. It has already been formed into delicate watch-wheels, and watches made with them have been presented to various high dignitaries by the French Emperor. We fear, however, that it cannot be produced in large quantities, nor at a moderate price, because it has to be reduced by acids, and then precipitated with an alkali, like the precious metals, and these processes are slow and expensive. Thus far, it has been obtained by M. Deville, of Paris, alone, in the form of ingots, capable of being worked into articles of use and ornament; there is, therefore, a wide door still open for improving the processes of its reduction. Two things are absolutely necessary for producing it at a moderate price: first, an abundance of rich raw materials, and secondly, a simple and cheap reducing process. Aluminous shales, in comparison with iron, copper, zinc, and lead ores, are not abundant, and thus, at the very first step, there appears an insurmountable obstacle to its cheap manufacture. If the processes of obtaining it, however, were improved, more attention would be devoted to prospecting for rich deposits. Some valuable discoveries of these might reward our own, as well as other countries. These hints we throw out for the benefit of all whom they may concern, viz.: the whole scientific world.

The Great Chemist of the Universe has displayed his wisdom, power, and skill, in various combinations of alumina. It occurs almost pure in those two precious stones, the *sapphire*, and the *ruby*—the one blue, and the other red in color—which possess a hardness but little, if any, inferior to the diamond. It is also

found in the *topaz*, in the *lapis lazuli*, and in *corundum*. In the arts, alumina forms the basis of some of the most beautiful colors, such as the Adrianople red, and the Alkanet-root lilac. It forms the basis of the beautiful porcelain from which we quaff the Chinese nectar, and of it is made the pyrometer, for measuring the highest degrees of temperature in furnaces. As the compounds of alumina are so abundant and useful, it is to be hoped that the pure metal itself will yet become as common, as its excellent and peculiar qualities will enable it to fill a space in the arts for which there is no substitute.

Encroachments on the Patent Office.—The Remedy.

We publish in another column some communications from Washington respecting the encroachments upon the Patent Office, to which we alluded a week or two since. We invite special attention to the remarks of our correspondent. It would appear from his statements that the Secretary of the interior, Hon Robert McClelland, entertains a deep hostility to the Patent Office, and that he is evincing the same by systematic but indirect attacks against its vitality and usefulness.

The ambitious Secretary seems to us grieved to think that this branch of the public service, though it was founded under the immortal Washington,—though it has ever been fostered and encouraged by our greatest statesmen,—though they erected for its exclusive use one of the most noble and spacious edifices which adorn the national capital,—though it has served more than perhaps any one department of the Government, to elevate, to benefit, and to strengthen the Republic,—though it flourished for years before its present assailant, or the office over which he is now, unfortunately, the chief, was thought of; this ambitious Secretary, we say, is grieved to think that the Patent Office enjoys so excellent a fame, and stands so high in the affections of the American people. He seems pained to reflect that the noble pile, out of which both himself and predecessors have stolen space for their clerks and account books, still bears its world-renowned title of "United States Patent Office." He longs to obliterate those living letters, and to substitute in their place a new sign—"Department of the Interior." He longs to clip the Patent Office of its attractions; to diminish its glory; to subordinate its chief-ship. He longs, in short, to have the world know that there is such a personage as the Secretary of the Interior. He sighs for the exclusive occupation of an imposing palace to give him that official dignity and importance which he now lacks. But while the Patent Office flourishes, all these ambitious schemes remain unsatisfied; the people will look upon the Patent Office building with veneration, and regard the Commissioner of Patents as an important officer of the Government. Hence his covert attacks; his undermining operations; his disguised hostility.

Now, we have no objection to the gratification of the Secretary's personal pride; we should be pleased to have him glorify himself to the highest pinnacle of fame, if he chooses. But we cannot countenance the unworthy mode he takes to accomplish his purpose. Like the fox in the fable, he seeks to make the Patent Office his goat, to coax it into the well, and then, rising on its horns, leave it behind helpless in the lurch. Such proceedings are unworthy of any man,—much less a member of the Executive Council of the nation.

There is a remedy for all such annoyances and troubles, which, sooner or later, we hope to see adopted. It consists in the creation, by Congress, of a Bureau of Invention, the Minister thereof to enjoy all the advantages that the other chief officers of the Government possess. At present the Patent Office appears to be regarded, by certain officials, as a sort of hybrid—neither one thing nor the other. Without proper independence, or even the power to regulate its own concerns, they pay it little respect, though all the while they must be sensible of its importance as an Institution.

Let the Patent Office be raised from this uncertain condition, in some such way as we have indicated, and no envious Secretary of the Interior will longer have power to check its growth, confuse its business, and destroy its usefulness.

American Genius Triumphant.—Remarks on Reaping Machines.

The intelligent Paris correspondent of the *N. Y. Times*, mentions, in a late letter, the gratifying fact that an American piano, manufactured by A. W. Ladd, of Boston, has been found worthy of a prize by the International Jury. This result justified, fully, the general opinion expressed of this piano, in our hearing, by several operators. They declared that it felt better under the touch than any of the pianos on Exhibition, thus expressing the highest possible compliment to the mechanical skill displayed in its construction.

"The specimen in question is to obtain a silver medal, and the President of the Jury informed the agent that, had it been in tune, it would doubtless have won a gold one. This is altogether the most significant result that can possibly be furnished to Americans by the Exposition of France. That a piano from Boston should come unheralded into the domain of the famous instruments of Erard, Pleyel, and Herz, and only miss the first prize by an accident of inattention, is truly remarkable."

It is also believed and currently reported in Paris, that the Jurors will award medals to McCormick's, Manny's, and Wright's reapers, to Pitt's thrasher, to Avery and Singer's sewing machines, to Richmond's plate metal cutter, and to Blanchard's bust-turning machine. The same letter also announces the sale of one of Manny's reaping machines to Prince Napoleon, and the patent right for France to a company. We are the more glad to herald this fact, for the reason that considerable fun had been poked at the American Department of the Exhibition, and because the agricultural industry of France needs the application of our improved implements; but in consequence of the abundance of hand labor, and owing to the extreme subdivision of the land, such admirable inventions are not likely to succeed as well in France as they do here and in England.

There are plenty of large farmers, however, who will eagerly avail themselves of these machines, and it appears to us that a fine field is opening in France for this class of American inventions. We shall not be surprised to learn that Manny, McCormick, and Wright, with their reaping and mowing machines, and Pitts with his grain thrasher and separator, find themselves richly paid for their enterprise in sending their machines to the great Congress of ingenuity. If we mistake not, one of the results of this exhibition will be to open a fine market for American machines generally, for, with all the boasted superiority of our maternal friends in Europe, Yankee ingenuity is a thing not to be sneezed at.

In connection with the subject of agricultural implements, we have a few words of advice to give our inventors and manufacturers of reaping and mowing machines, and first of all we present the following extract of a letter from Z. Leavenworth, of Leavenworth, Indiana, as a proper text on the subject:

"I wish to get another mowing machine. I have one of Ketchum's, (made 1853,) but it runs heavy, and one of easier draft is desirable. I have been watching in vain for the report of the Massachusetts Committee which gave the premium of \$600. All the committees appointed to examine reapers, and report on their merits, have failed in giving correct and reliable information, inasmuch as they have omitted to give the draft or power required to operate each machine. At fairs, the agents or proprietors of reapers and mowers, are sure to have choice teams for the purpose of working their machines in the most rapid, and apparently easy manner. Many of such machines, when obtained by farmers, have failed to give satisfaction because of their great draft—much greater than can be overcome by common teams on farms. (I have noticed the same thing at fairs with plows.) The power required to operate reapers, is a most important item to our farmers."

These remarks of our correspondent touch a most important point in relation to such machines, and we recommend it to the attention of all committees appointed to judge of reaping and mowing trials. It is no less important to the inventors and makers of these machines; they must be aware that if one reaper can do as much work as another, with one-third or one half less power required to draw it, there

is just so much saving in the working expenses of the farmer. It is no positive evidence of superiority in a machine, that it should, in a trial, surpass its competitors by a few minutes of time in cutting down a certain amount of grain. It may have been more ably handled, and its team may have been superior to all the others. If the *Paris Constitutionnel* of August 7th is to be believed, this appears to have been the case with the McCormick reaper in the French trials. It is well known from common reports, that it surpassed all the others in speed of execution, and that it was cheered triumphantly by the assembled multitude, but it is now asserted that it did not make such a favorable impression on the minds of the best judges of such matters as Manny's machine; the latter was more admired because of its compactness and lightness of draft.—The *Constitutionnel* states, that arrangements have been made for the manufacture of 1000 of these machines in Paris, for the harvest of next year. Hussey's, McCormick's, and Wright's reapers, operated well, but they were more cumbersome, and of heavier draft than Manny's, whose agent, Mr. Mabie, was offered 120,000 francs for the patent at the end of the last trial. We are convinced that great improvements will yet be made on reaping machines—principally in their workmanship and arrangement of parts, so as to render them more compact, easier of draft, and therefore of more undoubted value to our farmers.

A New Observatory.

A new and elegant observatory has been erected in Albany, N. Y., on an elevation north of the city, which commands a fine view of the Hudson valley for a great distance. It is not yet furnished with instruments, but these are in the course of construction, and before another year transpires it will be supplied with an able corps of astronomers, and all the necessary apparatus for the most refined observation of the starry heavens. It is to have a heliometer for measuring the angular distances of separate stars. The means to purchase such an instrument were furnished by Mrs. Dudley, an aged widow lady of Albany, who gave a check for \$6,000 within a few minutes after the subject was submitted to her consideration by Thomas W. Olcott, Esq. There are but two such instruments in the world, the one at Königsberg, Prussia, and the other at Oxford, England. The object glass of the heliometer is divided in halves. Each half gives a distinct image of every star submitted to the observer, so that by moving the halves far enough apart the image of one star can be made to coincide with another, and the distance by which the halves of the object glass are separated from each other gives the angular distance of any two submitted stars. The construction of such an instrument requires the highest exercise of skill in astronomical mechanism. Its erection does great credit to the citizens of Albany. A few years since, an association was formed in Brooklyn for the purpose of erecting an observatory, but, so far as we have been able to learn, it has done nothing towards accomplishing the object for which it was organized.

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