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Simplicity of Discovery.

From the complex, yet simple and wonderful nature of the human mind, man is fond of the mysterious, the complicated, and wonderful; and he is more ready to pursue new projects through mazy labyrinths of study, than along the straight road of simplicity. The famous Philistine general who came down to the Hebrew prophet to be cured of a fatal disease, treated, at first, with contempt the simple command of the prophet, "go wash in the Jordan and thou shalt be healed." He thought that some grand ceremony, or some wild incantation, would have to be performed to remove far from him his life-eating malady. How complex are false theories in comparison with the true. How complicated were the theories of Plato, in comparison with those of Newton; and who would have thought, that from the falling of an apple, the great philosopher would have made his *greatest* discovery. By simply condensing the steam in a separate chamber from the cylinder, and admitting it to the piston at both ends of the cylinder, the immortal Watt changed the whole nature of the steam engine and gave it new powers.

We may well admire the powers of that machine which can propel the gigantic steamboat over the stormy ocean, or whirl the thundering train of cars along their iron ribbed footway, surpassing the flight of the eagle in swiftness; but seldom, very seldom, do we find one, who, in beholding such wonders, is fully impressed with that divine truth, "God hath chosen the weak things of this world to confound the mighty." What are the elements that propel the steamboat or the iron car, and how many? Only two—fuel and water. The engine, the most complex part of the whole, is but the means to convey and apply the power. With the tree from the forest, or coal from the mine, and his boiler of water from a neighboring fountain, the engineer mounts his iron steed, and when all is ready, he touches his valve rod, his iron steed feels the *breath of his life*, and well may we apply the words of Scott,

"He is off, he is off, o'er bush, brake and scaur,
They'll have fleet steeds that follow, quoth young
Lord Lochinvar."

How complex was the electric telegraph of Soemering, with his thirty-five golden points, in comparison with the effectual and simple Electro-Magnetic Telegraph of Morse, who, with a single wire, sends the whispers of affection from lake to sea, on swifter wings than those of "*Love*."

All the great discoveries that have been made, are remarkable for their simplicity, because they are based upon the truths of science, and this implies that many errors may yet be found in its woof and warp.

In saying this much upon the simplicity of discovery—a theme upon which we might easily dwell, to fill up column after column—we would exhort all those who have a taste for the pursuits of science, or the advancement of the arts—agricultural or mechanical—to remember that simplicity should be their first, second and last considerations, to success.

Opium.

This drug is the juice which exodes from incisions made in the heads of ripe poppies, and rendered concrete by exposure to the sun. The best opium comes from Turkey, the East India kind is not so good. Opium occurs in brown lumps, not very large. Good opium is hard when cold, but becomes soft when worked in the hands. It has a strong offensive smell, and is very bitter to the taste. Proof spirit digested upon opium, forms *laudanum*. Opium has been long known as a deadly and dangerous narcotic; it has been supposed that the soporific effects of opium depended on morphia, but in 100 parts of the best Turkish opium only seven per cent. of morphia can be extracted; but morphia is not more poisonous than opium. Ure believes that the deleterious activity of opium is due to its union of an oleate or margarate of narcotine with morphia

Opium is a slow and a rapid poison. People can accustom themselves to it, and be able to eat as much as might destroy the lives of three or four at one dose, who were unaccustomed to it. Opium drunkenness is a horrible vice of the Turks and Chinese. Its drunken dreams are pleasing, but they reveal terrible results. The habit of opium eating is perhaps the most dangerous of all others—the most alluring—the most difficult to break up.

It is said that a great increase in the consumption of opium has taken place in America, especially in the Eastern States, within the past seven years, and its votaries are found principally among our women. It is a vice which should be frowned down by every person,—it is a drunkenness more deadly and vicious than that of spirits in any shape.

Rules and Regulations for Steamboats.

Our steamboats should be compelled to use gangway roads with railed sides. Many accidents have occurred by passengers being jostled and falling over the side into the water; and not a few deaths have resulted in such cases. Last week an old man, his daughter and child fell off the gang plank, at Albany, while going on board the Isaac Newton. Only for the prompt action of some of the passengers, they would have been drowned, for the officials on board, were either too careless or lazy to use active measures in rescuing the unfortunate individuals who, from the awry manner in which the plank was placed, were precipitated into the river. At every steamboat pier there should be one or more stout-built gangplanks, with a railing on each side, and fitted on wheels. This would form a safe bridge between the boat and the dock. Another useful regulation would be to have dock officers who would look after these things, and whose duty should be prescribed by city law, to order the boats to depart at their regular hours, as advertized. It is no uncommon thing, now, for some of our steamboats—those on the North River especially—to advertize their sailing hour at 6 P. M., and then wait until 9 before they start. There should be some way of preventing such evils—for great evils they undoubtedly are, and we know of no better plan than the one we have recommended.

New York Gas.

Mr. G. M. Kentish, in a communication to the *Tribune*, is out against the New York Gas Company charging fifty cents for 100 cubic feet of coal gas, as a reduction from seventy cents, the price of the old resin gas. Mr. Kentish exposes this fraud of change in price, by saying that coal gas is only one half as dense as resin gas, and the price for the coal gas should be reduced to 35 cents instead of 50. The old price, he says, was exhorbitant, but this makes it 43 per cent. more. Mr. Kentish is right; Parnel says that two cubic feet of resin gas, is equal in illuminating power to five cubic feet of coal gas. Coal gas can be made nearly as cheap in this city, if the business was well managed as in some cities in Europe, where the poorest families—as in Glasgow—burn it, at five times less expense than oil or candles, which are about the same price as with us. It is time that our people were awakening to a scientific knowledge of these things, which embrace the nature, manufacture and the economy of gas illumination. We are in favor of gas illumination because it is the most beautiful, convenient and economical—that is where monopolies do not love too high prices. We have plenty of coal beyond the Alleghanies, for the purpose, and the Blossburg coal, Pa., makes good gas,—this we know, for we have made it.

Navigating the Air.

Mr. Penington, the original projector of a flying machine to navigate the air, which has been noticed by us before, has returned from the far west, where he has been making some experiments on the great prairies. The Baltimore *Sun* regrets to say that he has not been sufficiently successful to enable him to come back in his own carriage. He is, however, sanguine of fully succeeding eventually in making a voyage to California, or even to Europe, in his car, through the air.

A large machine of this kind is now building near this city, by Mr. Robjohn. The canvass is all ready, and is about 80 yards in length and 50 in diameter. It is to be propelled by two oscilating five horse power engines, which are already provided and secured in the car. They occupy a very small space and are well made. They are to propel the huge gaseous monster by fan wheels, we believe. We await in calm contemplation the mighty results of this enterprise. We can say this much about it, that the workmanship will be well executed. The projector has at least great courage and deserves success—in any other department, he would attain it.

Lake Superior Copper.

The copper mines of Lake Superior are the richese in pure copper of any others in the whole world. Some masses of pure ore are discovered which weigh 60 and 80 tons. These are reduced to pieces, in the mine, of about seven tons, and then are hoisted to the top of the mine, where they are reduced to pieces of smaller size for shipping. Mr. J. S. Hodge, an eminent minerologist, in some remarks made before the Scientific Association at Cambridge, said that at the Minesota mine, near the Ontonagon River, he had an opportunity of witnessing, in June last, the most extraordinary mass that has yet been met with. Two shafts had been sunk on the line of the vein 150 feet apart. At the depth of about 30 feet they struck massive copper, which lay in a huge sheet with the same underlay as that of the vein—about 55 deg. towards the North. Leaving this sheet as a hanging wall, a level was run under it connecting the two shafts. For this whole distance of 150 feet the mass appears to be continuous, and how much further it goes on the line of the vein either ways there is no evidence, nor besides what depth it penetrates in the solid vein. It had been cut through in only one place, where a partial thread afforded a convenient opportunity. Measuring the thickness here as well as the irregular shape of the gap admitted, it was found somewhere to exceed five feet. Allowing the thickness to average only 1 foot, there would be in this mass 1200 cubic feet, or about 250 tons.

The mode adopted to remove the masses is to cut chanels through them with cold chisels, after they are shattered by large sand blasts put in behind them. Grooves are cut with the chisels across their smallest places, one man holding, and another striking, as in driling. A chip of copper three quarters of an inch wide, and up to six inches in length, is taken out, and the process is repeated until the groove passes through the mass. The expense of this work is from $9 to $12 per superficial foot of the face exposed. Fragments of veinstone enclosed in the copper, prevent the use of saws. A powerful machine, occupying little room, is much needed which would perform more economically this work.

Dr. Jackson stated that many of the mines of copper on the shore of Lake Superior would be entirely worthless to the companies owning them, and that the most profitable mine could never pay a dividend of more than five per cent. This fact is not owing to any deficiency in the amount of the article, but to the extreme difficulty of mining it.

In our opinion the hand drill described and illustrated on page 348, Vol. 4, Sci. Am., would be a most valuable tool to the miners of Lake Superior. By the drawing, any blacksmith or machinist might make a drill for five dollars that would do more work in one day with one man than four men with hammer and jumper. It is surely a most surprising thing, in this day, that pure copper is not worth the digging, because it is found in too large masses, and has to be cut or blasted—and the miners are not able to drill fast enough, because they use only the old jumper, or chisel. If the mining companies of Lake Superior want a machine powerful and compact to drill their copper, why don't they offer a premium for one of such and such dimensions, to accomplish so much work in a certain time. If they are liberal, and not mean about the matter, we warrant them that there will be found more than one man in the country, who would construct a machine to accomplish all that the most enthusiastic might hope for.

Great Chemical Discovery.

A Mr. Tighlman, an ingenious American gentleman, some time ago, discovered the great virtue of water, at high temperatures, to decompose certain substances, which before that period were, by the most eminent chemical authorities, supposed to be insoluble in water. He visited England and found that his discovery was not only new there, but was no sooner announced than men of wealth and scientific ability were found ready to engage in it. By water at a high temperature, Mr. Tighlman is able to take felspar and decompose it into alumina and potash, and to make from that common and heretofore useless material such salts of potash as the sulphate, chloride and chromate. Through the same discovery, Mr. Tiglman has made great improvements in the manufacture of certain acids, alkalis and alkaline salts, and they are destined to have great influence on the general welfare.

The Journal of Pharmacy states that Mr. Tighlman's discovery will be a saving of nearly one half the expense in the manufacture of soda, and we know that there is no better evidence of its value than to state that Mr. Tennant, of Glasgow, the greatest manufacturer of soda ash and potash in the world, has made an expenditure of between twenty and thirty thousand dollars in fitting up apparatus according to the plans of Mr. Tighlman. Notwithstanding the immense machinery already at work in Mr. Tennant's establishment, Tighlman's was so far superior that the privilege of using it was at once purchased by Mr. Tennant.

The above Journal also says, that it is established that there are seventy thousand tons of soda ash made in Great Britain annually, valued at forty-five dollars per ton, and equal to three million one hundred and fifty thousand dollars. The twin alkali, potash, is extensively used. Russia, Canada and New York alone export potash estimated at two and a half millions of dollars, and when it is considered that Mr. Tighlman is able to manufacture not only these, but sulphuric acid and many other highly useful articles, from common rocks extensively spread over Europe.

This discovery is one of vast importance to the whole world.

In 1838, sulphuric acid, valued at five millions of dollars, was manufactured in Great Britain, and Mr. Tiglman can obtain it from the same kinds of sources he gets his material for making soda and potash.

A Word to some Friends.

During a recent visit to Boston on business, we had the pleasure of making the acquaintance with several Editors, all of whom we found emphatically good fellows. We are especially grateful to Mr. Norris of the *Yankee Blade*, for his kind assistance in facilitating our business. Speaking of the *Yankee Blade*, it is one of the most sterling papers in this big country, and if any of our readers want a journal sparkling with bright scintillations of wit together with profitable reading, we would advise them to send $2 to Messrs. Matthews, Stevens and Norris, Boston. Mr. Simonds, the gentlemanly publisher of the *Saturday Rambler*, and *Pictorial National Library*, (a valuable monthly) stands ready to furnish the public with a journal excelled by none and equalled by few, save it may be the *Olive Branch*, published by T. F. Norris, which is too well known to require a puff from us.

Both of the above journals are prominent for their literary and moral excellenee. Mr. Kelly, the enterprizing and brilliant Editor of the *Aurora Borealis*, illuminates a large circle of subscribers by the weekly visits of his great northern light, not only that he is a tolerably good looking fellow but has a tongue of junior lightning. Last but not least among the mamany excellent Boston literaries, comes the *Boston Museum*, edited by Mr. Putnam, a very talented writer; in point of mechanical execution this journal stands at the head, and its weekly visits to our *sanctum* are always acceptable.

It would be difficult to find, in this country, five newspapers of more substantial merit than the *Yankee Blade*, *Saturday Rambler*, *Olive Branch*, *Aurora Borealis*, and *Boston Museum*." We wish them every success.