Correspondence.

Iron Melting.

To the Editor of the Scientific American:

I have carefully read the article on iron melting in your issue of October 20, 1888, and do not agree with it as a whole. I believe if cupola blast and all things connected with melting iron are right, there will be but little trouble in melting 10 to 1 or even better than that. A man from Marshall, Texas, offers $250 to any one who will melt 9 tons at the rate of 14 to 1 in his 38 in. cupola. In my opinion a cupola that size is far too small to melt such an amount of iron, and I think there is no more chance to practice economy with a cupola that is too small than with one too large. My experience is rather limited, and I will be careful not to say too much.

I am in the habit of melting from 3 to 5 tons of iron per day, and see no reason why I could not melt 20 tons at the same rate, that is, 10 to 1.

When I first took charge here, I found I could not melt better than 6½ to 1, but have made several changes about the cupola, and can now melt every day we run more than 10 to 1.

The iron is plenty hot enough for our lightest castings, and as long as cupola runs a stream the iron is fit to use. Below you will find my average for eight heats. I use an old style cupola, 38 in., with three tuyeres:

	Iron.	Fuel.
August 22, 1888	7,200 lb.	675 lb.
" 23, "	7,600 "	700 "
" 24, "	7,600 "	700 "
" 25, "	7,600 "	700 "
" 27, "	6,900 "	625 "
" 28, "	6.500 "	600 "
" 29, "	6,200 "	575 "
" 31, "	6,100 "	575 "

I would be pleased to melt before witnesses if any one doubts the above. I weigh all fuel and iron used, and know just what I am doing.

JOHN H. CROUSE,
Foreman, J. O. Wisner, Son & Co. foundry.
Brantford, Can., November, 1888.

Two Wrinkles.

To the Editor of the Scientific American:

Some parties are doing quite a business in different cities advertising and selling an "outfit" for copying letters without the use of a copying press or water. The "outfit" consists of an ordinary tissue paper copying book, a sheet of blotting paper, a piece of smooth pasteboard, and a bottle of special ink. The whole trick is in the ink. Any copying book will do.

I saw through the thing as soon as I saw a copy, and tried it at once with perfect success.

I just took ordinary ink and mixed glycerin with it. I wrote a long letter with it, blotted the letter very lightly, then placed it under a tissue leaf of the copying book, and rubbed the latter with my fingers, getting a very fair copy and then a second copy.

Of course a copying press and water are both unnecessary.

All that is needed is to take any ordinary ink and mix glycerin with it, say one-fourth to one-third of the volume of the ink.

The glycerin keeps the writing wet till copy is taken, and on this account—its slow drying quality—this ink is not convenient for other than copying work.

There is another interesting trick in another line, whereby the advertiser sells ordinary head light kerosene for $10 a gallon, which is a pretty fair profit, as it only costs 7½ cents. A compound in five-ounce bottles is extensively sold to printers under various names as "Inkoleum," "Rollerine," etc., at 50 cents per bottle, or $10 a gallon.

It is used to put on printers' rollers, to thin printers' inks, etc., a few drops only being used.

Every printer has plenty of coal oil in his house, and it looks funny to see him send 50 cents to get five ounces of it. But he never thinks of trying the coal oil that he has in his oil can. The trick here is in disguising the kerosene so that the printer does not know it is kerosene. The peculiar *fluorescence* of kerosene is destroyed by adding a small amount of resin oil. To make this resin oil mix with the kerosene, a little sulphuric ether is added.

A little oil of cedar disguises the kerosene smell, and so the printer pays 50 cents a bottle when he already has plenty of kerosene in his house, five ounces of which cost him about one-fifth of a cent.

The only useful element in the mixture is the kerosene. A. B.

Cincinnati, November 3, 1888.

IT is said that corn cobs, when treated as follows, make an excellent fire kindling: Put six gallons of water into a boiler, and one pound of saltpeter. Heat it to the boiling point, and then put in as many cobs as the water will cover. Let them stand a short time, and then take them out and place in the sunlight until thoroughly dry, when they can be easily lighted with a match and will make a hot fire.

The Making of Postal Cards.

The people of the United States use annually about seven postal cards for every man, woman, and child; that is to say, our total consumption for a year reaches 400,000,000, which is considerably more than are employed by all the rest of the world. This enormous number are all printed, cut apart, counted, and wrapped up in packages of 25, by machinery that would stand comfortably in a small bedroom, and that requires no assistance whatever from any operative, so long as it is supplied with paper, ink, and paste. A visit to the abode of this wonderful mechanism is naturally full of interest.

The postal card factory—the only one in this country—is a part of the great establishment of the Fort Orange Paper Company (C. C. Woolworth, president), at Castleton, near Albany. These works, employing 200 hands and occupying (though, of course, not covering) a tract of 35 acres of land, have quite a picturesque location among the hills a mile back from the village, with which they are connected by the New York Central, Hudson River, and Fort Orange Railroad—the name is about as long as the track—and include every appliance for the manufacture of many different kinds of paper and cardboard—white, brown, and colored. Approaching the place from Castleton, one notices first the immense and very graceful chimney, founded on solid rock and rising 126 feet into the air— a tower-like structure of no little beauty. Around and near this are grouped a number of large buildings, one of which we will enter, following the course of the raw material from which, in part, most kinds of paper are made—being bales of rags of every possible color, size, shape, and condition of dirtiness. This unpleasant stuff needs a lot of cleansing, as may well be imagined, and accordingly the first thing done with it is to toss it by handfuls into a "duster," where it is tossed and shaken at a great rate, and liberated, so far as may be, from adhering and extraneous dirt. Next it goes to a long line of women and girls, who remove hooks and eyes, buttons, rubber, fragments of whalebone, and whatever other foreign material they find. Then it is cut up by a fast-running steam driven machine into fragments of moderate size, dusted (or ought we properly to say *un*dusted?) again by another machine, and dropped into great boilers below, where for six or seven hours it is subjected to the action of a hot chemical liquid, under pressure, to loosen its color and its still remaining dirt. Coming from the boilers, it is thoroughly washed by special mechanism, pure water being forcibly driven through the mass, and is then soaked for three or four days in a solution of chloride of lime, which bleaches it completely, leaving it pure snowy white. It is next beaten and squeezed by beating engines until reduced to a semi-pulpy condition,* and then conducted into large hogsheads called "stuff chests," whence it is pumped directly to the Fourdrinier paper machine.

This imposing piece of mechanism, really a compound of a variety of machines by which a great number of operations are kept going simultaneously and harmoniously, receives at one end the pulp prepared as above, which comes pouring in from the stuff-chests in the form of a very thin, watery paste; and delivers, at the other end, the completed paper, calendered to its final surface, trimmed at the edge, and tightly rolled up like so much ribbon. The pulp first flows upon a fine wire netting, where it is sharply shaken for the purpose of causing its fibers to knit together like felting and acquire some degree of consistency. Then passing along on endless blankets, it is squeezed by a succession of rollers to get it into proper shape and remove the moisture (some of the rollers farthest along being steam-heated, to aid the drying), and finally pressed hard or "calendered," to smooth the surface, and wound up in rolls. We should not think that more than two or three minutes could elapse between the entry of any particular portion of the pulp into the machine at one end and its exit from the calenders, finished paper, at the other, and during that time it has traveled 125 feet.

Now supposing that it is postal card paper that we have been watching, we follow a roll of it to the printing room and see it put into the combined printing press, cutter, counter, and wrapper—a machine that the inventor thought he could construct in three weeks at a cost of five hundred dollars, but it actually took four years and *eight thousand* dollars. This machine prints from a number of engraved plates on the surface of a fast revolving cylinder, against which the web of paper is closely pressed, thus repeating the pattern over and over again on the ribbon, as one might say; and then, as before stated, cuts the cards apart, wraps them up in packages of 25, with a band pasted around each, and delivers them by belt conveyors to the packing tables, where girls put them into paper boxes, each holding 500 cards. These again are inclosed in wooden cases of varying size, and shipped to every post office in the United States—so that the dispatching department of the works may be said to have some sixty thousand separate customers to attend to. Orders for the current month are unusually heavy, aggregating fifty-five to sixty millions, which will weigh about 175 tons; and we saw a fireproof vault containing some 25,000,000 cards ready to go. These are all domestic postal cards, it should be understood, no international cards having been called for during the last six or eight years. They now cost the government 48 cents per thousand, being less than two-thirds of the sum paid when they were first manufactured.—*Country Gentleman.*

* And mixed with wood pulp, when that material is employed.

Patents for Small Things.

Among these may be mentioned the "stylographic pen," and a pen for shading in different colors, producing £40,000 per annum. The rubber tip at the end of lead pencils has yielded £20,000. A large fortune has been reaped by a miner who invented a metal rivet or eyelet at each end of the mouth of coat and trousers pockets, to resist the strain caused by the carriage of pieces of ore and heavy tools. In a recent legal action it transpired in evidence that the inventor of the metal plates used to protect soles and heels of boots from wear sold upward of 12,000,000 plates in 1879, and in 1887 the number reached 143,000,000, producing realized profits of a quarter of a million of money. As large a sum as was ever obtained for any invention was enjoyed by the inventor of the inverted glass bell to hang over gas to protect ceilings from being blackened, and a scarcely less lucrative patent was that for simply putting emery powder on cloth. Frequently time and circumstances are wanted before an invention is appreciated, but it will be seen that patience is well rewarded, for the inventor of the roller skate made over £200,000, notwithstanding the fact that his patent had nearly expired before its value was ascertained. The gimlet-pointed screw has produced more wealth than most silver mines, and the American who first thought of putting copper tips to children's shoes is as well off as if his father had left him £400,000 in United States bonds. Upward of £2,000 a year was made by the inventor of the common needle threader. To the foregoing might be added thousands of trifling but useful articles from which handsome incomes are derived or for which large sums have been paid. Few inventions pay better than popular patented toys. A clergyman realized £400 a week by the invention of a strange little plaything to be seen for a long time in every toy shop window, and even in the streets of London. That favorite American toy, the "return ball"—a wooden ball with an elastic attached—yielded the patenee an income equal to £10,000 a year, and an income of no less than £15,000 per annum to the inventor of the "dancing Jim Crow." The invention of "Pharaoh's serpents," a toy much in vogue some years ago, was the outcome of some chemical experiments, and brought the inventor more than £10,000. The sale of the little wooden figure "John Gilpin" was incredibly large for many years, and a very ingenious toy, known as the "wheel of life," is said to have produced upward of £100,000 profit to its inventor. One of the most successful of modern toys has been the "chameleon top," the sale of which has been enormous. The field of invention is not only vast and varied, but is open to everybody without respect to sex or age, station or means.—*Invention, London.*

Youth and Old Age.

A writer who is a good observer, and has had considerable experience, thus defines the difference between the old and young. There is, he says, a wide gulf between youth and ripe old age, hence the proverb "You can't put an old head on young shoulders." This proverb was written by an old man; youth had nothing to do with it. Youth don't believe the old man knows anything, and the old man expects continually that the young man will be along saying, "I didn't know it was loaded." The wise young man will seek the counsel of those ripe in years and experience and avoid the mistakes in life. But Young America will continue to figure in the divorce courts, and compound his debts at ten cents on the dollar. He don't want to be told that it is loaded; he prefers to find out himself. He gets there, and pays the piper generally.

What is Luck?

A philosophical definition of luck is given by an English writer as a capability of being incapable. "The first Rothschild was probably right, from his point of view, when he said that he never would employ an unlucky man. On the other hand, the lucky man is usually the man who fits his fortunes; who, whether apparently able or stupid, can do just what his especial circumstances require him to do. Very stupid men are often ready men, armed with a readiness as of dogs when they twist from under a cartwheel unhurt. The 'fool who makes a fortune' is usually a man with just the foresight or just the judgment or the intuitive perception of the way things are going—a faculty like long sight or keen hearing, and independent of intellectual power—requisite to make large profits quickly. In fact, the fortunate man is usually the man who, in consequence of some hidden quality in his nature, deserves fortune."—*Popular Science Monthly.*