

STEEL MAKING IN CHINA.

In the manufacture and use of steel, as in other symbols and aspects of civilization, the Chinese appear to have attained a very early and remarkable proficiency. Mr. Jeans, in his recent work on steel, says that unfortunately Chinese records do not enlighten us as to the precise period at which the art of reducing metals from their ores became known in that country, but it is evident that it must have been some centuries before the Christian era. It is not, indeed, unreasonable to conclude that this knowledge was at any rate concurrent with, if not antecedent to, the discovery of the attractive power of the loadstone, which seems to have been used by the Chinese in the reign of the Emperor Hoangti, about 2690 B. C. Mention made of steel in the most ancient of the Chinese writings, and Leib-tze, an author who flourished about 400 B. C., describes the process by which it was made. In the Yu Kung section of the Shoo King, Book I, it is stated, that among the articles forming the tribute of Yu., were nautical gem stones, iron, silver, steel, stones for arrow heads, etc. Legge points out the difference of soft iron, and hard iron or steel, as distinguished by the Chinese, and remarks that in the time of the Han dynasty, ironmasters were appointed in several districts of the old Leangchou to superintend the iron works. With the exception of this passage, however, it is considered probable that there is no distinct allusion to iron in Chinese writings older than 1000 B. C. In describing the manufacture of steel in China, the Pi-tan, or Pencil-Talk, states that wrought iron is bent or twisted up, and unwrought iron is thrown into it. It is then covered up with mud and subjected to the action of fire, and afterward to the hammer. On this passage, Day remarks that it comes remarkably near describing the process of immersing wrought iron either into molten cast iron, or heating it with iron ore and fuel covered over with layers of mud or clay, to exclude, as much as possible, the oxidizing influence of the external atmosphere. At a subsequent period the Chinese records describe the different kinds of steel produced. That obtained by the first process they call ball steel, *Tsun Kang* (from its rounded form), or sprinkled steel, *Kwas Kang* (from the pouring of water). Another kind is spoken of as "false steel," "wei tee," and it is quaintly added that "iron has steel within it, as meal contains vermicelli." In the "Peut Saow" (a work of the Ming dynasty), again, three kinds of steel are described, thus: "1. That which is produced by the adding of unwrought to wrought iron while the mass is subject to the action of fire. 2. Pure iron many times subjected to fire produces steel. 3. Native steel, produced in the southwest, at Hai Shan, and which is like in appearance to the stone called *Tsun-shi-ging*—purple stone efflorescence." Steel continues to be manufactured in China to the present day. James Henderson, a commissioner of Li-hung-chang, the Governor-General of Chihli, and minister of the young King of China, states that "the steel which comes to Tien-tsin from the upper Yangtsee is highly prized, and bears much higher prices than the Swedish steel imported into China.

**A JAPANESE INVENTION.**—The Japanese have devised a new process for photo-engraving, which is described as follows: A substance is used in making Japanese lacquer which becomes as hard as stone when exposed to the action of sunlight. A slab covered with this material is exposed 12 hours to daylight, which is allowed to pass through the "negative" plate placed in front of it. By this time the slab has become hardened to different degrees, according to the intensity of the light falling on it, or in other words, according to the light and shade of the negative in front; and upon carefully scraping away the softer parts a pictorial surface in low relief is obtained similar to an engraver's block, and suitable for printing from.

SIGNALING INSTRUCTION.

Many of our readers no doubt have often seen United States officers, surveyors and others signaling or talking together at a distance by the waving of small flags. Telegraphs and telephones are well enough in their place, as when we wish to converse often over any given place; but on shipboard, or in the field, at a distance from those conveniences, we need some other device. No sailor ignorant of the ordinary signal code should be allowed to go to sea in any capacity of command. Signaling should be taught in all our schools. We give below, for the benefit and instruction of the curious, the alphabet and system in use by the U. S. army, which is claimed to be superior to any other.

The second columns are the equivalents for which the corresponding letters may serve as contractions. With four of any two kinds of things, fixed signaling can be done. Calling one's right side one, and his left side two, he can transmit any message by waving a handkerchief according to the following table:

Letters	Word Equivalent	Signal Number	Letters	Word Equivalent	Signal Number
A	after	22	P	put	1212
B	before	2112	Q	quiet	1211
C	can	121	R	are	211
D	did	222	S	station	212
E	of the	12	T	the	" = "
F	for the	2221	U	you	112
G	ground	2211	V	very	1222
H	have	122	W	wood	1121
I	if the	1	X	next	2122
J		1122	Y	why	111
K	o'clock	2121	Z		2222
L		221			1111
M		1221			2212
N	not	11			1112
O	of	21			

If we have four apples and four oranges, and we designate the apples ones, and the oranges twos, with them then we can spell out anything. Thus to spell the word *system* we would from our right to left (so that they may come in regular order for the reader) first place an orange, then an apple, then an orange (= 212 = S); after withdrawing the S place an apple, an orange, and an apple (= 111 = Y); next repeat the S (an orange, an apple, an orange), next place an orange (= 2 = T), next an apple and orange (= 12 = E), and last an apple, an orange, an orange, an apple (= 1221 = M).

With a small flag a sweep to the left, two to the right, and one to the left would spell *be*. A great many contractions can be made and are introduced in the code.

**REFINING SPELTER BY A NEW PROCESS.**—We have lately been shown a sample of spelter, says the *Iron Age*, showing unusual sharpness of crystallization and brilliancy of fracture, which is said to be as nearly chemically pure as the metal can be made. It was made from common spelter, under a process patented by Mr. A. Harnikel, 83 Maiden Lane, New York. We also have a piece of sheet zinc rolled from it cold, which exhibits great ductility and unusual toughness. We are informed that the specific gravity of the new spelter is 7.2, and that its resistance to dilute sulphuric acid is many times greater than that of any grade of this metal hitherto experimented with. For fine brass, cartridges, German silver and artistic castings, we should presume it would have great utility. The price ranges from eight and a half to nine cents.

**A NEW THERMO-ELECTRIC PILE.**—M. Clamond a French electrician, is reported in *La Nature* to have devised a *thermo-electric pile* upon a novel principle, which is capable of yielding electrical currents of considerable tension. A large instrument of this kind has been successfully employed to run several electric lights.

SHAVING.

The more I reflect upon the mysteries of neurology and animal chemistry, the more confident I am that, while we are the least suspecting it, trifling errors in our daily life are producing important effects upon our corporeal systems; and I declare it as my deliberate conviction, that the habit, which may almost be styled American, of using the razor upon the face, is sufficient to cause a large proportion of the lamentable evils which affect the human race in this country.

It appears by experiment that the beard, if shaved, grows four to five times faster than if unshorn. In this calculation, an item is omitted which it is difficult to estimate, i. e., the stimulus given the beard, by the first application of the razor in adolescence, the experiments being made upon beards after they have acquired an unnaturally rapid growth. The effect of this early stimulus may be fairly counted at double the natural growth; then reckoning the difference in size and weight of the fiber, which is treble, and we find the frightful truth to be, that we raise 30 times the natural quantity of beard! Thus it is evident that the true beard is exhausted at a very early age, after which the system is forced to supply a substitute. Now nature will not submit with impunity to extraordinary demands upon her vigor, and that which requires her to produce in a lifetime 30 times as much beard as she was first inclined to, must certainly be considered as such. She is fatigued in proportion to the effort, let the particular kind be what it may; although her recuperative powers are great, she insists upon having repose, even when working at a rate chosen by herself. If that repose is denied her, she takes her revenge by breaking down the mechanism.—*Journal of Health.*

**WHAT MEN NEED WIVES FOR.**—It is not to sweep the house, and make the bed, and darn the socks, and cook the meals, chiefly that a man wants a wife. If this is all he wants, hired servants can do it cheaper than a wife. If this is all, when a young man calls to see a lady, send him to the pantry to taste the bread and cakes she has made, send him to inspect the needle-work and bed-making, or put the broom into her hands and send him to witness its use. Such things are important, and the wise young man will quietly look after them. But what the true man most wants of a wife is her companionship, sympathy and love. The way of life has many dreary places in it, and man needs a companion to go with him. A man is sometimes overtaken by misfortunes, and meets with failures and defeat; trials and temptations beset him, and he needs one to stand by and sympathize. He has some stern battles to fight with poverty, with enemies and with sin, and he needs a woman that, while he puts his arm around her and feels that he has something to fight for, will help him to fight; that will put her lips to his ear and whisper words of counsel, and her hand to his heart, and impart new inspiration. All through life—through storm and sunshine, conflict and victory, through adverse and favoring winds—man needs a woman's love. The heart yearns for it. A sister's or a mother's love will hardly supply the need. Yet many seek for nothing farther than success in housework. Justly enough, half of these get nothing more. The other half, surprised beyond measure, have obtained more than they sought. Their wives surprise them by bringing a nobler idea of marriage, and disclosing a treasury of courage, sympathy and love.—*London Christian Union.*

**RESTORING THE BLACK COLOR OF CLOTH.**—It is a very common and easy practice to restore faded black colors by simply brushing them over in succession, first with a solution of logwood extract, and then a weak solution of bichromate of potash. Another way is to take first a decoction of crushed nutgalls, and then a solution of sulphate of iron. In either case the black color is easily restored by a brush or sponge. We prefer a stiff brush.