

BIG GUNS IN CHINA.

DESCRIPTION OF THE IMMENSE ORDNANCE MADE THERE.

The Great Factory in Shanghai Employing Two Thousand Celestials Covers One Hundred Acres—The Chinamen Are Expert Mechanics—Wages and Hours.

SHANGHAI, China (Special).—One hundred acres of factories for the making of arms and munitions of war!

Vast foundries for the smelting and rolling of steel!

Gun works turning out cannon as big as the biggest! Shops covering acres devoted to the making of the latest of modern magazine rifles!

An army of 2,000 celestials in blue gowns with their pigtail tightly wound about their half-shaven heads manipulating with their slender yellow fingers the finest of the modern world's improved machinery, and doing successfully all kinds of factory work under Chinese foremen!

These are some of the wonders I saw at the great government arsenal near here today.

Anyone who thinks that China is asleep to what is going on in the modern world has only to visit one of its great government gun factories to be convinced of his mistake. Away out here in China there are gun foundries doing even more wonderful work than any similar institutions in the world, and that to a large extent with native made machinery and just now with Chinese iron and Chinese coal.

Of the 2,000 men employed in the Shanghai works only two are foreigners, and these are consulting engineers, one of whom, N. E. Cornish, is an Englishman from Devonshire, who was for years connected with the great Armstrong gun works in England, and the other, Mr. Bunt, an Englishman, who not only knows how to run all kinds of machinery, but has invented several engines, and who, with Mr. Cornish, is making many improvements in the Chinese munitions of war.

One of China's big guns.

over those of other nations. It was through Mr. Cornish that I was able to go over the gun works, and with him I had chats with the Chinese managers, foremen and workmen.

Leaving the Hotel des Colonies, in the foreign quarter of Shanghai, I rode in a jinriksha, pulled by two men, far out into the country.

Just outside of the walls of the native city I passed a guardhouse filled with Chinese soldiers. The sun came out at the moment, and I attempted to photograph them. But when they saw the camera they scowled and went inside the guardhouse. Not far from this I came to a fortification which I afterwards learned was the barracks of the troops which the viceroy keeps here to guard the arsenal and to protect Shanghai. A white wall, perhaps twenty feet high, surrounded them and I could only see the great flags of black net work embroidered with red Chinese figures twenty feet long, which floated from a pole above the tent of the commander. I saw many soldiers, however, and I photographed a good natured one who evidently did not understand what my camera was. These soldiers were dressed in all sorts of bright colors and the uniforms of many of them consisted of the brightest of blue cotton saques, trimmed with black velvet and ornamented with red stripes. They wore wadded cotton pantaloons, which they tucked into black short topped wadded cloth boots, and their heads were covered with stiff skull caps of silk. They looked entirely different from the people about this part of China, and are much more muscular and taller than the Chinamen at home. They come from the interior, and the best fighters among them are from the rebellious province of Hunan, where the insurrection against the missionaries of a year or so ago originated. There are only a few thousand of them in this barracks, and they are but a small part of the army of the Viceroy of Nanking, who lives at his capital in the interior.

Reaching the arsenal we stopped for a moment under a white wall, on which was a gaudy painting of one of the heroes of Chinese mythology, who is supposed to give luck to the officers within, while one of these Chinese soldiers took my card in to Mr. Cornish, and a moment later I was inside of these vast works and surrounded by the din of machinery. Practically the only difference between these works and those of any of the great gun factories of Christendom lies in the gorgeous colors of red, blue and green in which the Chinese delight and with which they paint not only the interior woodwork of their shops, but some of their machines as well, and in the fact that all of the work is done by Chinamen. The first room we entered was about the size of the biggest shop in the Washington navy yard. It covered, I judge, about an acre of space, and in it were being turned out some 12-inch guns for the navy. You have seen pictures of such guns in the newspapers. They are the biggest made at our navy yard, and they are immense iron cannon, the barrels of which are thirty-five feet long, and which launch projectiles of steel which weigh 1,000 pounds. To make one of these guns costs in the neighborhood of \$50,000, and the Chinese are now just finishing their fourth gun of this kind. Those completed have been tested, and shown equal to anything made in Europe or America, and the projectiles for the guns are made here. The Chinese, however, like the other nations of the world, now believe that these immense guns are not so good for defense and warfare on the sea as the smaller varieties, and they will build no more of them at present. Near these I saw some twenty-five ton guns, and then visited the shops, where about 300 Chinamen were at work making the latest improved patterns of Armstrong rapid-firing guns. I looked at a 4.7-inch gun of this kind which had just been completed, and was shown its working. It moved so easily that a baby could have almost worked it, and the Chinese foreman in charge told me that they had just finished a dozen of these weapons, and that they were now working on some which would fire 100-pound shot.

China has no scruples as to patents, and she gets now all of the latest improvements in war machinery and copies them

here. There is no doubt about the great mechanical ability of the Chinese. Here are 2,000 men, who have been brought up on lines entirely different from those on which they are now working, and they make as expert workmen as our mechanics, who have had generations of hereditary capacity and years of experience. A great part of the machinery used here was made by Chinamen, and Mr. Cornish tells me that he found that parts which he had thought it impossible for a Chinaman to turn out and which he had expected would have to be imported at great expense from Europe, had been made by these men from



CHINESE SOLDIER.

drawings. Some of them are so expert that only general directions and the knowledge of the results required need be given them and they will straightway make the designs and castings. I was shown one machine—I think it was for the rifling of some of the guns, though I am not sure as to this—which contained a screw of only three inches in diameter and thirty-five feet long, which was designed and cut by a Chinaman, and I took a time exposure of a yellow-faced Chinaman, who makes the finest of the improved sights of the Armstrong guns. The work is as delicate and as beautiful as that of the watchmaker, and there is an improvement on the original, which this man has added. The rifling machine for the big guns would have cost \$15,000 to import. These Chinamen were shown the drawings and they made it for half that sum. It is so in nearly every variety of machinery, and among the things now actually being made in these works are all sorts of modern projectiles, from the revolver bullet up to great shots of steel weighing 1,000 pounds. They make cartridges from those fitted for a revolver to the kind required for a six-inch rifle, and I saw Chinamen drilling steel, cutting out grape shot and making brass cartridge cases from disks of metal, and paid a visit to the warehouses, where I was shown the 200 different kinds of shot and shrapnel which are made here. They are now turning out about thirty thousand pounds of shot a day, and they have made recent experiments with Chinese iron which demonstrate its superiority in some respects over any other iron in the world.

No one knows much about the mineral resources of China. But coal and iron are said to exist in nearly every one of the eighteen states or provinces of the empire, and there have been some iron mines which have been worked for years. Up to this time, China has been importing the raw material for her arsenals, but she is now experimenting with her own supplies, and the manufacturing China of the future will probably be entirely independent of the rest of the world. The coal and iron formations of the province of Chili are said to be the largest in the world, and the product is unsurpassed. The iron now used here comes from the province of Hunan, in about the centre of China, and some idea of its character may be learned from a test which was recently made here. A shot was cast of this iron for a three-inch rifle, and it was fired against a target with the same charge and the same gun in competition with imported shot of steel. The target consisted of three iron plates an inch thick, interleaved with boards of wood. The steel shot penetrated the target, but none of them went through it. The Chinese cast iron shot passed clear through the target and were lost. The process of manufacture of the iron is not known at the arsenal. It comes here in the shape of iron plates or slabs, from half an inch to two inches thick, and I should say, at a guess, for I did not measure them, 15x35 inches in size. I saw a great quantity of the ore lying outside of the foundry. It is of a reddish brown color and looks much like some which is got from the Lake Superior mines. The pigs or slabs are laid down here at about \$20 a ton, or \$10 a ton in gold, thus costing about half a cent a pound.

There are hundreds of steam engines of all kinds in these works and they are all managed by the Chinese. I saw one of 400 horse-power, which was in charge of a boy and a youth of 22, and I noticed that numbers of the Chinese mechanics are under age. Some of them are old men, but it is hard to tell the age of a Chinaman, as they all shave, and there are few gray hairs. I spent some time looking at the men putting up an engine of 2,000 horse-power. It is of the most modern variety, and has cost a fortune. The immense furnaces burn gas, and a look into them would scare the religion out of any modern Shadrach, Meshach and Abimelech if the viceroy of Nanking cared to play the part of the cruel Babylonian king of the Scriptures.

FRANK G. CARPENTER.



CHINESE MANAGER OF A 2,000 HORSE POWER ENGINE.

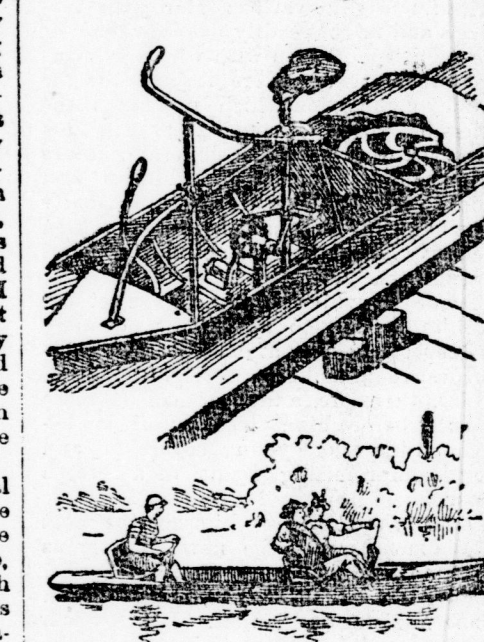
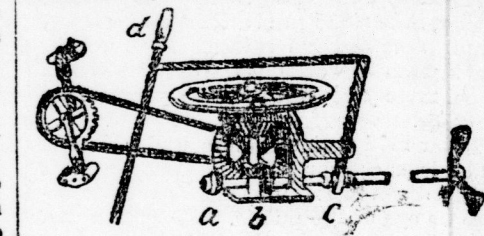
THE NEW BICYCLE BOAT.

QUITE POPULAR ON THE LAKES OF THE BOIS DE BOULOGNE.

The Motive System of the New-Fangled Pleasure Craft—How the Ratio of the Gearing is Calculated—The Question of Speed.

Small pleasure boats propelled by a screw actuated by pedals have been observed since last summer upon one of the lakes of the Bois de Boulogne. Their mechanism is ingenious. The idea of substituting a screw actuated by pedals for oars or paddle wheels is not new, but this is the first time that we have seen it realized in a sufficiently practical manner to assume the proportions of a genuine enterprise. The motive system of this new boat, devised by Mr. Vallet, has much analogy with that of bicycles, and it is for this reason that it has been called a bicycle boat. One of the models especially (the one figured 2), which is designed for one person, recalls the bicycle. In another model, designed for several persons, the saddle is replaced by an arm chair, as shown in the general view at the top of the engraving. In both systems the motor is the same. It consists of a horizontal shaft that passes through the stern of the boat and carries the screw. To this shaft are keyed two bevel wheels, A and B, either of which may be thrown into gear at will with a third mounted upon a vertical axis. The latter receives motion from the pedals through the intermedium of an endless chain running over a sprocket wheel. A hand wheel keyed to the top of this axis keeps up the motion and renders it regular.

The shaft of the screw is movable in the direction of the length of the boat and this, through a system of levers, D, C, that the pilot has within reach, permits of throwing either the pinion, A or B, into gear at will. There is thus obtained, without any necessity of modifying the



BICYCLE BOAT OF THE BOIS DE BOULOGNE.

motion of the pedals, a backward or forward movement or even a complete stoppage, if the shaft be given an intermediate position. As for the steering, that is effected through a bar, analogous to that of bicycles, which controls the rudder.

The ratio of the gearing is so calculated as to obtain a multiplication of five, and the pitch of the screw is 58 centimeters. Each revolution of the pedal therefore causes the boat to move forward 2.9 meters. Supposing that one stroke of the pedal be given per second, an advance of 174 meters will be made per minute or 10.5 kilometers per hour. But practically it would be impossible to keep up one stroke of the pedal per second very long, and it is necessary, too, to take into account the resistance of the water, which increases very rapidly with the speed of the boat. From our own experiments, we believe that it is possible to attain a speed of about eight kilometers per hour in calm water and without wind.

This question of speed, however, is of no great importance, for we have a pleasure boat rather than one for racing, and the speed is of slight consequence, provided that it is adequate. We have been surprised at the easy motion of the pedals and at the facility with which the maneuvering is done without fatigue. It is a very agreeable mode of locomotion, that we find more convenient and more within reach of everyone than that effected by the oar or paddle.—La Nature.

A Novel Rocket Lamp.

A novel "pocket lamp" can be made as follows: Get an ounce vial, a small piece of phosphorus that will go in the vial, and some olive oil. Heat the oil to the boiling point, fill the bottle one-third full and cork tightly. When you wish to use the "lamp" pull out the cork and admit the air, then cork the bottle again. All the space above the oil will glow with a soft, bright light, which will last from two to five minutes.

When the glow fades if you cut the more light, at once pull out the cork again. As soon as fresh air is admitted the light will be as bright as ever. By this light you can see objects two or three feet distant, and it is perfectly safe as there is no possibility of flame.

This is the kind of lamp that is carried by the watchmen in English and continental cotton mills and in powder mills, and they carry no other. They are carried in manfactories where inflammable explosives are handled; this light, only on a larger scale, is used.—Life.

South African Diamonds.

"I met an interesting man out in Chicago a couple of months ago," said Henry Fry, a traveling man, at Willard's today. "His name was Cameron, and he had just returned from the South African gold and diamond fields. He said there were enough diamonds in that country to stock four or five worlds with buttons almost, but that the mines are in control of a great syndicate, of which Sir Cecil Rhodes is the head. Cameron said that when he was shown through the company's establishment he saw thousands of buckets filled with diamonds, but the combination controlling them keeps track of the market, and when prices are good a certain quantity of the gems are taken to London, care being always taken not to send enough to glut the market. Any man caught trying to smuggle a diamond out of the country is given seven years at hard labor, so it is a dangerous business."—Washington Post.

HORRIBLE ILLUSIONS.

Tricks Played by the Camera of a French Photographer.

Amateurs in photography are doing much more to introduce novelty into their work than are the professional photographers. This is perhaps because the professionals follow in the beaten track and strive for perfection rather than variety. Certain it is that since the discovery of the dry plate, which made amateur photography possible, people have begun to learn some of the astonishing and amusing facts which the camera may be made to disclose.

People have become so accustomed to regard a photograph as the record of a



THE HEAD ON A PLATE.

single scene taken by a quick exposure that they never stop to think that two, or even three, exposures may be made in completing a picture, and that meanwhile the subject may have been shifted.

This is the way the accompanying picture was made, showing the head on a plate, as well as others showing a Jeopartied man looking at himself, showing a head on a table looking at the man about to begin his meal, and one showing the head in a wheelbarrow. The originals are almost as horrible to look at as any of the guillotine photographs which French realists have been taking at actual decapitations "in the interest of science," as they carefully explained.

The picture herewith reproduced is the work of Mr. B. Riccart, of Sainte-Foix-les-Lyon, in France, and has excited the wonder and admiration of boulevard crowds in Paris, who morbidly gazed over the horrible details and exclaimed that science had made another great step forward, bringing scenes of blood and carnage within reach of the poorest man. This is the view of the subject which regards a dead face as a rich morsel, hitherto reserved for people of wealth or daring, and heaven only knows what the French will not produce in the way of photographs when the next great European war begins to afford a wide variety of "subjects."

One absolutely indispensable requisite in making photographs such as these which Mr. Riccart has produced is a natural black background. Mr. Riccart secured this through the open door of a dark room, combined with diaphragms skillfully arranged in the interior of the apparatus between the objective and the sensitized plate. This is the surest method of obtaining the desired effect with the greatest precision without the junctions being visible and with perfect clearness for the section of the parts removed.

An Adventurous Mariner.

A novel experiment in ocean navigation is to be attempted by a Nottingham enthusiast who has been occupying himself for a year past with the construction of a boat in which he proposes to cross the Atlantic during the forthcoming summer. The vessel, which is built of iron, and is only 10 feet 6 inches long, with 3 feet beam and 2 feet 6 inches in depth, and is thus the smallest craft that has ever attempted such an adventurous voyage. It has what is known as a "whaleback" deck, and the cabin, lighted by glass windows at the side, will be completely water-tight when closed, fresh air being obtained by pipes. Should the tiny craft be overturned the inventor claims that it will automatically right itself. She will be fitted with a ten-foot mast from the foredeck with jib and mainsail, and additional motive power will be supplied by a geared hand screw. The navigator intends to start from Nottingham, sailing down the Trent to Hull, and making for the Atlantic by way of the English Channel. He expects that the trip will occupy him something over a month.—London Telegraph.

Traits of the Horse.

It is difficult to understand how the legs of horses stand the wear and tear of work in our great cities, where every step of their iron-shod hoofs is upon a hard, unyielding road. There is no other creature living, with the exception of the donkey or mule, which can long bear the constant battering entailed by rapid locomotion over a paved surface. But if we look at the structure of the horse's legs we see how it is that the jar and vibration do not injure him more. His "pasterns," the part just above the hoof, play a little at each step, and so break the force of the concussion. He is, in fact, mounted on springs. This is one chief reason why he is a pleasant animal to ride. Anyone who has tried riding a cow or ox has found the difference between the easy, elastic movements of the horse and the jolting and joggling of a horned mount.—North American Review.

Hypnotism.

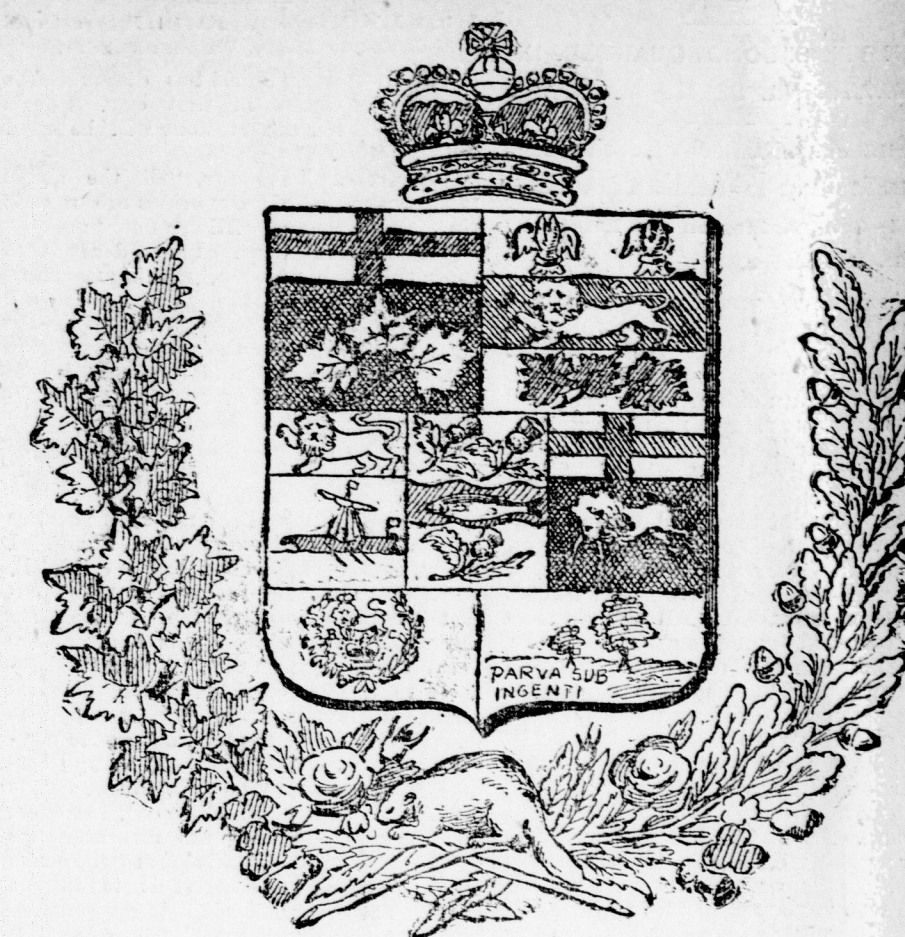
"There has been a great deal of stuff and nonsense written about hypnotism, as if it were something very abstruse," said an Arch street physician. "In fact, it is an every-day phase of mental abstraction. Any one may hypnotize himself in a few minutes by closing his eyes, directing them inward and downward, and then, imagining his breath to be vapor, watching its inhalation and expulsion from the nostrils. Babies invariably look cross-eyed before going to sleep, in the way producing what hypnotists call 'transfixion.' Fishermen often hypnotize themselves watching a cork on a surface of shining water. An hour passes as if it were a few minutes."—Philadelphia Record.

More Than He Had Bargained For. "Did she receive him when he called?" "She not only received him, but introduced him to her father to boot."



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Whenever and wherever the common patent medicines of the day failed to cure—when doctors, after honest striving, gave up their patients as incurable—Paine's Celery Compound extended the mighty

right hand of power, and saved from death and the grave those who had faith to hold of the rescuing hand. No other medicine holds such a record of wonderful works and cures in our young Dominion, and no other has ever received such notices from physicians and the people of the country. The honors won by Paine's Celery Compound span this broad Dominion from ocean to ocean. The seven provinces have awarded it the palm of victory for its marvelous and triumphant successes.

This is a position at once high and commanding—a monument of fame and honor that time and circumstances can never detract from.

Readers, ye who are weary, brain-tired, sickly, suffering and diseased, this great discovery in medicine is offered special for your troubles and physical burdens. It will restore to you the blessings you eagerly crave for—a healthy body, a clear brain, bright eyes, the glow of health on the face, and the quick and elastic step. You must decide at once; your course must be marked by progress or retrogression. You have the incontrovertible evidence and testimony of thousands of our Canadian people to guide you; all have testified that Paine's Celery Compound "makes people well."

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