

teenth century, the epoch at which the Chinese knew the first that were imported from Europe (1654). Upon this subject we read in the memoirs concerning history, science and arts by the missionaries of Pekin in 1782: The emperor, Young Tching, who reigned from 1723 to 1735, says in his preface to the sublime instructions of Cheng-tzu-Guogen:

"At the end of the Mings dynasty (first years of seventeenth century) Europeans having entered China, and having for the first time made one or two sun dials, the emperors of the Mings took them as a precious treasure. Toward the tenth year of Chun-Tchi (1654), the emperor Chi-Tzou-Hoang-ti received from these same Europeans a small clock which, of itself, struck the hours. It was not allowed to leave his side. Later on he obtained larger ones. Similar ones were made, as far as to external form and to internal wheels, but, since the method of working the springs so as to make them flexible and elastic was unknown, they were not correct.

"Since I have been reigning, having learned from some Europeans the method of working these springs, I have made hundreds and thousands of clocks that mark the time very correctly. I have had the striking clock mended that was first offered to the Emperor Chi-Tzou-Hoang-ti, and of which he was so jealous. It runs perfectly and I shall confide it to you presently. You, who are still young, have for your amusement ten or twenty of these clocks that strike of themselves and that I have given you. Do you not regard this as pleasing to you? You ought, then, to eternally recall, with a grateful feeling, the advantages that have been communicated to you by your ancestors and your father."

It was toward 1680 that Khang-hi created clock shops within the walls of the palace, and to which he called artisans and workmen from all parts of the empire. The monopoly of the trade was conceded to the Christian natives whom the missionaries had taught to work. These workmen, however, were not very skillful, for, more than a century afterward, three clocks presented to the emperor in 1795 by the embassy of the India Company, having been injured during the voyage, three clockmakers in the service of the court came to offer their services to the embassy; but the mechanic of the latter, not having been able to come to terms with them, refused their offer and preferred to them three missionaries residing in Pekin, whom he considered more adroit, although they were not of the trade. In fact, the repairs were properly made. When we study the pieces

that the Chinese clockmakers have constructed, we find merely bad copies of European clocks. They have changed nothing in the movements adopted by them as models; and, as for the external form of the cases, they have given this, it is true, a Chinese character, but they have, nevertheless, produced nothing remarkable.

The Chinese have allowed themselves to be far excelled by the Japanese in mechanical finish and decorative art. The aspect of a Chinese clock sometimes revolts the eye through the mixture of Chinese and European elements found therein (Figs. 4, 5). The Chinese have produced no mechanical clockwork properly so called, but have been in this merely bad copyists.—La Nature.

Uses of Air Jets.

A writer in Cassier's Magazine states that in turning soft steel shafting, it is customary to use water to which a certain percentage of sal soda has been added, in order that the water may not rust the finished work, and with a keen tool of the proper temper, and wide enough cutting edge to cover the feed, a very smooth and shining surface can be produced. By using a small air jet, that is air issuing from an orifice of about one-sixteenth inch in diameter, the work can be finished very much the same as if water is used. A smooth surface will be produced with this important difference, that the tool will not crowd, and, consequently, the shaft will be nearer true and straight when using a compressed air jet than when using water. The same sized air jet may be used to advantage at different

places around the shop. It is excellent for cleaning off benches and machines, and is much to be preferred to the common dust brush used for this purpose. It is also very convenient at the drill press for blowing out the chips in drilling and tapping bottom holes.

BICYCLE RACING AT SPRINGFIELD.

The programme of races of the Springfield Bicycle Club at its September tournament was one of unusual interest, and attracted the attention of wheelmen in all sections of the country. Many of the leading professional and non-professional bicycle riders participated, and the attendance was very large. This tournament has been styled the "American Cycling Derby," and our illustration represents the conclusion of the mile open race on the second day, with Walter C. Sanger winning. It has been generally conceded that Sanger rode the greatest races of the year on this track, and that he stands far above the common run of cycle racers, but it is said that Sanger personally lays great emphasis on the merits of the tires which he rode in these trials. They were the Vim tires made by the Boston Woven Hose and Rubber Company, and their peculiarity consists in a roughened surface, technically called a pebble tread, giving the tire a high speed record. Sanger entered and won in three events, the two mile handicap in which he won on the second day being a highly sensational and brilliant performance. The advantage of the pebble tire was well



SANGER WINNING IN A BICYCLE RACE AT THE SPRINGFIELD MEET.

shown in the race we illustrate. The bunch came slowly round the turn toward the open with half a dozen men in front of Sanger and Tyler. Sanger was very near the last man in the string. Directly on the point of the turn, the bunch began to go fast, and so great was their speed when they got to the head of the stretch that they had to swing wide, owing to the smooth surfaces of their tires. Sanger, having the roughened surface, simply held to the pole very closely, and by the time the rest of the bunch was ready to slide in toward the pole, Sanger was a good ten feet ahead of them. It was but an easy matter for him then to increase his lead until he finished far ahead, as is shown in the cut. Had his tires not been furnished with the pebble tread, he would have been obliged to have followed the bunch into the stretch, and lost the position which the tires gave him.

Not a Bad Idea.

In Germany when a man is convicted of the offense of beating his wife he is not locked up at once, but is allowed to continue at his work all through the week. At the end of the week he is looked after by the police, who put him into prison until Monday morning. His wages are taken from him and delivered up to his wife. On Monday morning he is handed over to his employer. If he will not then work, he is thrown into jail again, where, says the Newcastle Chronicle, there is no doubt he will have to work a great deal harder than he does when at his usual employment. In some countries this would be regarded as intolerable paternalism.

The Michigan Spread Eagle.

At the recent meeting of the American Bar Association at Detroit, Michigan, the address of welcome was delivered by Hon. Don M. Dickinson, who glorified the town and State as follows:

"A few days ago a Senator of the United States from the great State of New York referred to the city of Detroit as situated on the shores of Lake Michigan!

"Now, we would have him know, and all the rest of our friends of the Atlantic coast who have never been west of Buffalo know, that a commerce passes the port of Detroit in but the seven months of open navigation seven times as great, in tonnage of merchandise, as the entire year's carrying trade of the North Atlantic highway, and more than twice as great as the combined entries and clearances of the whole world at the ports of New York and Liverpool together. In the summer of 1893 a member of the Supreme Court of the United States—one of the most eminent men produced by this republic, and one of the greatest judges who ever wore the ermine—spent a month within sight of the two endless processions of shipping that pass each other on this water road. Mere statistics had not greatly impressed him, but the actual view of the living facts filled him with astonished conviction. To that visit more than anything else, I believe, does our fresh water Neptune owe his belt and spur of knight; for in December, 1893, the court gave to our lakes and connecting rivers the full legal title and dignity of 'high seas,' ranking with the oceans and seas of the world.

I say, in passing, that now, with our sister States of the Northwest, we are asking, with more and more urgency—nay, we will soon demand—from the United States, a free and, above all, a wholly American outlet to tide water, so that we may ship our goods to every open port on the earth without change of bulk.

"In agriculture, Michigan's resources can feed all the nations; in building material, we can build cottages and palaces for them all; we can gridiron the world with our iron and steel; and from our manufacturing can equip the lines with rolling stock. We produce the most and best iron of any State or nation.

"Our copper product is now at least half of the world's supply. Copper mining is remunerative, but I suggest to our fellow citizens of the United States from abroad that it would pay us better if the government would open its mints to the free and unlimited coinage of copper as money, impose the legal tender quality, fix a ratio (at any figure—that is not material) with gold

and silver, and then maintain the parity of the three metals with all the financial resources of the republic, 'independently of and without waiting for the assent of foreign nations.' Michigan would like this, and if it should turn out well, we might, following Lycurgus, try it with our iron by and by. But that's another story, as Kipling would say."

Tuberculosis.

Professor Delépine, writing on this subject, has shown that—taking very large numbers as the basis of his estimate—at least 16 per cent of cattle are afflicted with this disease; and that, whereas in some districts it may be comparatively rare, there are parts in which a non-tuberculous cow is the exception. Pigs also are affected in the same manner, although not to the same extent, about one in every thirty-six being attacked by the disease. Cats and dogs also are subject to tuberculosis, and it is to be feared from their exceeding friendliness may be a source of danger to children with whom they play. Although the form of tuberculosis with which poultry are affected differs in some particulars from that of man, it is a very common disease, and commits great ravages in poultry yards. But any animal which conforms with man's habit of dwelling under artificial shelter is apt to contract tuberculosis, and so it is that whether they be monkeys, camels, giraffes, antelopes, llamas, lions, tigers, foxes, tapirs, zebras, etc., they all, according to Professor Delépine, are liable to tuberculosis when they are kept in menageries.—Hospital.