The safest precaution is to pipe the water supply in from a distance, so that the people will not need to keep a supply of water in vessels.

How well the government has succeeded in stamping out yellow fever, is proved by the statement of Governor Magoon, made during his recent testimony at the Senate investigation at Washington, that January 26, 1906, was the seventy-fourth day since there had been a case of yellow fever at Panama, and the ninetieth day since there had been a clearly established case at Colon.

An even more important problem than that presented by yellow fever is the control of malaria throughout the Canal Zone. The ten thousand natives of the district are distributed in about twenty small villages along the route of the canal, and these people are very generally affected with malaria. A microscopic examination of the blood of these people, taken at random at various points along the line, showed that out of several hundred cases, fifty per cent contained mosquito parasites in the blood. Four times out of five, if the female Anopheles bites a native she becomes infected, and when she bites one of our nearby laborers, he in turn becomes infected. Hence, if our laboring force is not to be completely used up, as was that of the French government, preventive sanitary measures must be taken.

There are two ways of approaching this problem; either by doing away with the infected human being, or by doing away with the mosquito. Since it is out of the question to do away with the infected natives, the remedy must be sought in the extinction of the mosquito. If some substance could be introduced into the circulation of the infected man and kill the parasite, and at the same time not be injurious to the man, the desired object would be effected, and in quinine has been discovered the suitable poison. This vegetable substance is harmless to man and fatal to the malarial parasite. Most of the effective tropical sanitarians, the Germans and the Italians conspicuously, have achieved a great success by inducing as large a proportion of the population as possible to take regularly small quantities of quinine, and they have succeeded, without adopting any other measures, in doing away with malaria in the several localities.

The disease may also be successfully attacked from the side of the mosquito, and the Anopheles may be as effectively exterminated as the Stegomyia by covering up water containers, clearing up the yards, preserving the surface of the road so there will be no puddles, instituting a regular system in all towns for the collection of garbage, and by the use of oil. Asked in regard to the prevalence of malaria, Governor Magoon stated that the percentage of malaria on the Canal Zone today is no greater than it was in any of our frontier States while they were new countries in process of being settled. Col. Gorgas confidently expects to get malaria as completely under control as yellow fever is now known to be.

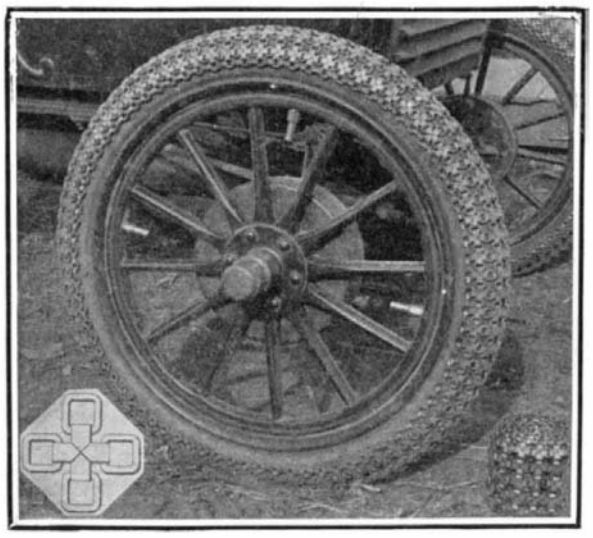
Price of Carrier Pigeons.

The cost of valuable pigeons, even at auction sales, is higher than generally supposed. Within a few weeks, 92 pigeons of the Coucke variety produced a total of 3,772 francs, or 41 francs per head on the average. More recently, according to M. Thauzies, 196 pigeons belonging to M. Hausenne, of Veviers, sold for 14,000 francs, or 71 francs each on the average. Certain subjects, where the competition was lively, brought 240, 300, 400, and even 550 francs. A single amateur paid the sum of 1,485 francs for three pigeons. After having read these facts, hunters who so far forget themselves as to fire at carrier pigeons will be doubly criminal.—La Nature.

Treatment of Pyrites Containing Gold.—Several geologists, notably Signor Mors, have expressed the opinion that wherever traces of free gold exist, there is in the neighborhood a still richer source in the form of combined gold. This theory has been confirmed by the process of a Belgian chemist, M. Body, who, experimenting in Italy, has actually effected the geological synthesis of the formation of alluvions and, according to Italian journals, has confirmed the theory attributing the formation of placers to volcanic action. The process is based, not on the elimination of the sulphur, but on its addition. The yields of gold resulting exceed those obtained by means of leading and cupellation. Founded on the polysulphuration obtained by a chemical disaggregation of the ore in presence of special salts under the influence of a temperature not exceeding that of the cherry red for a comparatively short duration, the action of this disaggregation disengages gold from its most stable combinations. In the Piedmont factory, where the process was carried out, the expense, it is said, did not exceed 10 or 15 francs per ton of ore treated. In fine, obstinate pyrites was converted into a product which could be treated by ordinary methods. As gold-bearing pyrites occur in large quantities in nature, it is evident that the new method has a wide field for development.

A NEW DETACHABLE NON-SKID TIRE PROTECTOR.

A patent has just been granted to Mr. Lewis Slama, of Humboldt, Neb., on a new tire guard for automobiles, to prevent skidding on wet pavements or slipping on snow or ice. The construction of the guard is clearly illustrated in the accompanying engraving, which



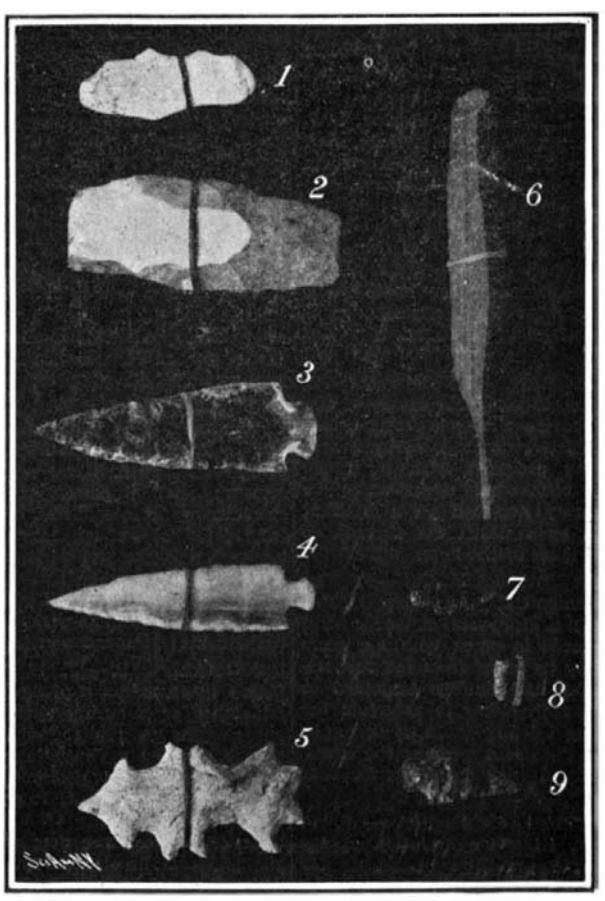
IMPROVED TIRE PROTECTOR.

shows the device in position on an automobile wheel. The guard, it will be observed, is made up of cruciform links and ring-like links alternately connected together to form a broad chain or heavy netting, which is mounted on the tire. The cruciform links are very simply made out of sheet metal cut to the shape of a cross, the four arms being passed through ring links and bent in toward the center, as shown in the detail view. The links along the edges of the guard are made a little smaller, so that the guard will shape itself to the form of the tire. For this reason, when the guard is applied to the wheel and the ends are joined, it will keep its position, even when quite slack. The only parts of the guard that bear against the tire are the flat cruciform links, the edges of which are turned up, so that there is no danger of wear. We are informed that the guards shown in the photograph were in constant use on the same tires for several months, and that although the tires were old when the guards were applied, no tire troubles were experienced in the hundreds of miles run. Aside from its non-skidding advantages, the guard serves to prevent destructive side wear, due to running in ruts, and also affords a protection against puncture. When not in use the band may be conveniently rolled up, as shown in the foreground of the illustration.

ARROWHEADS SHAPED WITH A WOODEN IMPLEMENT.

BY F. C. MASON.

Pictured in the accompanying engraving is a remarkable set of glass and flint arrowheads, which were chipped out of the rough material with an ordinary stick of oak as a tool. The wooden tool is shown in the photograph, and its worn end indicates the use to which it has been put. The work is that of Ernest Baurman, a young lad living near Berlin, Mich., who without instruction learned the trick after three years of experiment. The boy became interested in the arrowheads which were turned up on his father's farm, and became curious to learn how the Indians could have made them without metal tools. His curiosity led to a careful study, not only of the arrowheads themselves, but also of the chips which had been split off in making the arrowheads. This, he says, taught him in what direction the pieces were flaked off, and gave him the clew which led him to the solution of the mystery. Before deciding on a wooden stick as a proper implement for fashioning arrowheads, he first tried many different materials, but eventually came to the conclusion that a stick of oak was the most suitable. The arrowheads shown in the illustration were made in the presence of Mr. Kendal, a friend of the writer's. Fig. 1 is a chip removed from the piece of flint illustrated in Fig. 2, and shows how large a bit can be removed when necessary. Young Baurman, who had previously operated on glass, was given a piece of French mirror plate, and out of this he formed the beautiful arrowhead shown in Fig. 3. The work was executed in about an hour, and is superior in style and finish to any prehistoric specimen of flint ever seen. Fig. 4 is an arrowhead chipped out of opalescent glass, and Fig. 5 is a specimen of work on a piece of white flint, which shows how intricate a design the boy can follow. A flint arrowhead is shown in Fig. 9. Among Mr. Kendal's specimens was a small piece of volcanic glass or obsidian. The piece was ½ x ⅛ x 1½ inches long. He handed it to the boy, requesting him to make an arrowhead out of it. The boy replied that with his permission he would break off a piece to see the texture of the material. Permission was granted, and about half an inch was broken off. Then out of the larger piece the boy fashioned the arrowhead represented in Fig. 7. The remainder is shown in Fig. 8. This arrowhead is almost perfect in its symmetry, the point being as sharp as a needle and the edge keen, but not jagged. The thickness, at the thickest part, measures about 3/32 of an inch, and the tang for fastening to the arrow is not over 3/64 of an inch thick.



GLASS AND STONE ARROWHEADS FORMED WITH A STICK OF WOOD.

But most remarkable is the instrument used in making the arrowheads. This is shown in Fig. 6. It is a simple piece of oak about 5 inches long and slightly pointed. The exact movement of operation Mr. Kendal has not mastered, but it seems to be a twisting action which flakes off the chips. I made some experiments for myself on a piece of flint, and succeeded in removing flakes with a small piece of hard maple. The largest chip measured about ¼ x ¼ inch. The boy removed flakes as large as ½ x 1¾ inches. The secret lies in a knowledge of the composition of the texture of the stone. You must start the flake at the right place each time. For many years scientists were puzzled by the same problem that presented itself to young Baurman, namely, how arrowheads of flint could be fashioned without metal implements. The solution of the problem was found in Tierra del Fuego, where the natives fashioned implements of flint and glass with tools of walrus bone in much the same way as the Michigan lad performs his work. To the latter, however, belongs the credit of being the first white man to master this art.

New Microphone Transmitter.

A new form of microphone transmitter has lately been invented by the Italian engineer Quintana Majorana, of the government telegraph department. It differs entirely from the ordinary carbon microphone which is in common use, and is based upon the capillary contractions which the sound vibrations are made to produce upon a liquid jet. The principle upon which this action is based was observed by Chichester Belt some twenty years ago. The contractions of the liquid vein rise to corresponding variations in the electrical resistance of the circuit. Using an induction coil we are able to obtain telephonic currents which under favorable conditions may reach, for sounds whose vibration is 500 periods per second, an intensity of 100 milliamperes. This is a much more powerful effect than can be produced in the telephone at present. Besides the loud-speaking telephones, we may remark the Bailleux microphones which are used on the government lines in Italy and give only a current of 20 or 25 milliamperes, which is among the highest figures. In the new instrument it is claimed that the sound is clear and sharp. The construction is not as simple as a carbon microphone, but there is a great gain in power which will give it the advantage.

Concentrated Lye.—By combining different salts contained in wood ashes in the following proportions, though they are not absolute, a good lye is produced: 16 per cent of sulphate of potash, 2 per cent of potassium chloride, 76 per cent of carbonate of potash, and 6 per cent of carbonate of soda. The compound can be made up in small tablets, weighing about 0.0130 of a gramme, for bleacheries and for household use. Each tablet is sufficient for 40 liters of water; it will clean the linen, giving a perfect white and leaving a good odor.—Revue des Produits Chimiques.