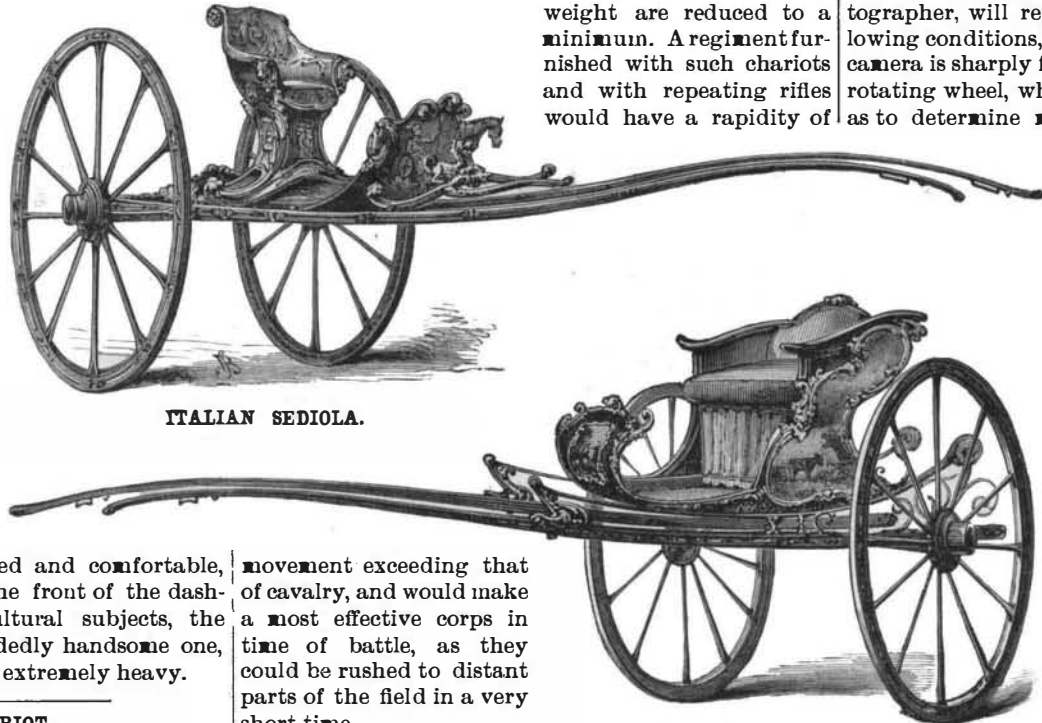


**CARRIAGE MAKERS' WORK IN THE LAST CENTURY.**

It was not until the latter part of the seventeenth and the commencement of the eighteenth century that the inventor and mechanic seem to have applied themselves to making carriages which could be used with sufficient comfort to attain any degree of popularity. The most of the specimens we have of the work of an earlier period must have been extremely clumsy and awkward for actual service, though some of them are richly carved and elaborately decorated. In the French museum of Cluny is a fine collection of eighteenth century carriages, two singular vehicles belonging to which are represented in the accompanying illustrations. It is said that a vehicle something like the *sediola* here shown is still used in some parts of Italy. It is fixed without any kind of suspension to the shafts, obtaining its spring from their great length, and is allied to the Norwegian *carriole*, the Neapolitan *calesso*, and the Cuban *volante*. The body is decorated with carvings of mythological subjects in bold relief, and the wheels are elaborately painted, animals and birds being profusely represented on the tire. The Dutch *tilbury* shown is built more after the style of our gigs at present, being suspended on straps which go over small wheels at the back, so they can be loosened or tightened at will. The seat is padded and comfortable, and the sides and back, with the front of the dashboard, are pictured with agricultural subjects, the vehicle being on the whole a decidedly handsome one, strongly built, but without being extremely heavy.



ITALIAN SEDIOLA.

DUTCH TILBURY.

**A SCYTHIAN CHARIOT.**

M. MEISS, U. S. C. E.

I was much interested in the drawing published in a late number of the *SCIENTIFIC AMERICAN SUPPLEMENT*, No. 528, describing an ancient Egyptian chariot wheel found in a recently opened tomb.

I send you a sketch of a chariot no less curious, which I find in my sketch book, and which I think had a somewhat similar origin. The vehicle represented in the sketch was taken from an Egyptian tomb of the date 1400 B. C.

It is said to be of Scythian origin, and probably formed part of the spoils of some Egyptian victory. Only a portion of the rawhide lashings with which all the joints were secured now remain. The hub is a composite affair, consisting of an inside tube made in two pieces, and afterward put together with wooden rings fitting over the ends of the tube.

The spokes, which are of wood with a natural crook, are made like the letter L, and are four in number, being fitted into a groove in the hub; the long arm of the L extending out to and into the felly, and the short arm bent at right angles and notched and fitted to the adjacent spoke. The whole was firmly bound together with rawhide.

The fellys, two in number, are scarfed together between the spokes and also lashed with rawhide. The

The weight of the whole vehicle, harness, yokes, etc., I estimated at not over 50 pounds, and the method of attaching to the horses must have left them with almost perfect liberty of motion.

A squadron of such chariots, with two men (a driver and an archer) in each, must have been an exceedingly efficient sort of light artillery.

Perhaps we may witness in our own day, when cavalry has become only a sort of mounted infantry, a return to the methods of 3,000 years ago. There are great advantages in such a light cart as this chariot. It is too low to be upset, and can be taken over any sort of country. The harness and weight are reduced to a minimum. A regiment furnished with such chariots and with repeating rifles would have a rapidity of

movement exceeding that of cavalry, and would make a most effective corps in time of battle, as they could be rushed to distant parts of the field in a very short time.

I append the following dimensions: Axle, 79 in.

long; seat, 39 in. long, 20 in. deep; pole, 1½ in. diameter small end, 3 in. diameter large end; wheels, 39 in. diameter; hubs, 12¾ in. long; yoke, 35 in. long, outside to outside; neck fork or saddle, 10 in. long.

The chariot is now in the Etruscan Museum at Florence.

**Photography by a Lightning Flash.**

BY PROF. EDWIN J. HOUSTON.

Mr. Albert S. Barker, of Philadelphia, has recently succeeded in taking two very fair photographic negatives of outside objects while illumined by no other light than that of a single lightning flash. These photographic views were taken at 7 P. M. on Thursday, October 29, 1885, near Philadelphia. The night was excessively dark, the wind strong, and the rain heavy. The camera was placed in an open window, with the slide drawn. The lightning flash came in less than one minute, when the slide was returned. The plate holder was then reversed and suitably placed for a second exposure. The plate was one of the highly sensitive gelatine films.

Mr. Barker developed the plates the same evening.

It is very doubtful if the average severe flash in this latitude does not endure or continue for a very much longer period. Despite the popular belief to the contrary, the author has frequently observed the motion of foliage when illumined by no other light than the lightning flash. This would not, of course, be the case if the flash were even approximately instantaneous.

It is a very significant fact that in the photographs of Mr. Barker the foliage shows unmistakable evidence of having perceptibly moved during the period of exposure; thus showing that it was by no means instantaneous.

It is to be hoped that Mr. Barker, or some other photographer, will repeat these exposures under the following conditions, viz.; to make the exposure while the camera is sharply focused on moving foliage or a rapidly rotating wheel, while illumined by a lightning flash, so as to determine more definitely the duration of the flash.

In the case of the lightning flash, the large percentage of blue rays would of course render the plate more sensitive to the extremely short exposure by practically prolonging the same, since the ordinary photographic chemicals now employed are especially sensitive to the blue portions of the spectrum.

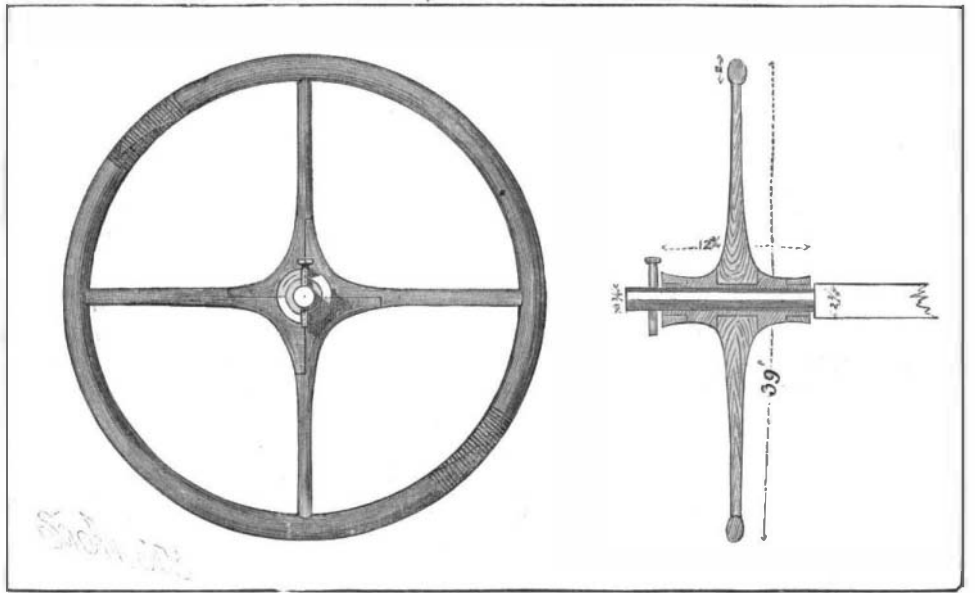
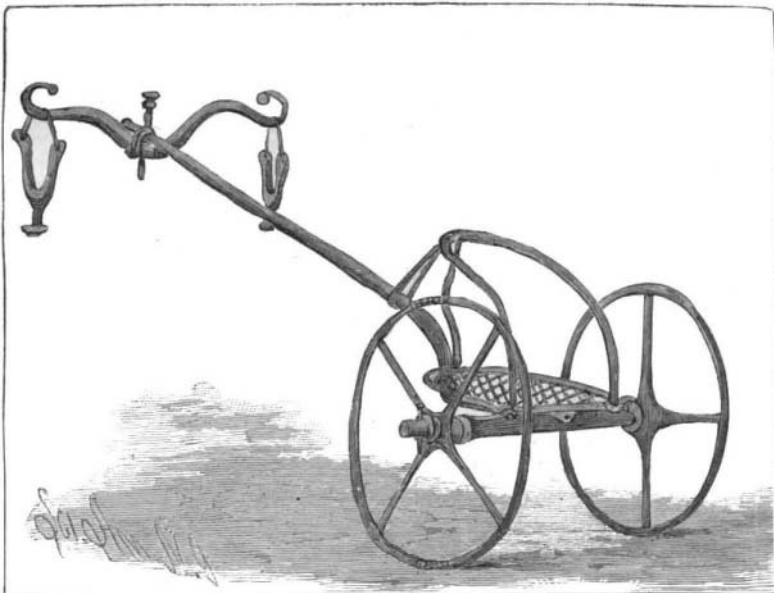
It would appear from the facts developed by the photographs of Mr. Barker, that the method of measuring the duration of the lightning flash, as adopted by Wheatstone and others, which consists essentially in endeavoring to detect by the unassisted eye the change in position of a rapidly moving wheel or other object, while illumined by the flash, might be greatly improved by substituting for the eye the sensitive photographic plate, since the latter is apparently far more sensitive than the eye.

Should photographic pictures of a rapidly rotating wheel, whose rate of motion was known, be taken while illumined by a lightning flash, the displacement of the image on the negative would give far more reliable data for calculating the duration of the flash than the methods heretofore employed.

Mr. Barker's photographs, therefore, are not only interesting as showing how extremely sensitive the photographic plate may be made, but are also of interest as throwing some light on the possible duration of the lightning flash.—*Franklin Journal*.

**Origin of Diastase.**

Emile Laurent has investigated the question whether diastase is a product of bacterial action, or whether it can be formed without organic intervention. He placed seeds of lupin, maize, barley, and helianthus to germinate under a bell glass, over water which had been previously boiled, the seeds having been first freed from superficial micro-organisms by the ordinary processes of sterilization. When the sprout began to show, the seeds were introduced, with all necessary precau-



A SCYTHIAN CHARIOT.

section of the felly is oval or elliptical, and I could not discover that there was any provision made for protecting the wood with a tire of any sort. The floor of the chariot was of rawhide thongs, and must have made a very elastic footing indeed.

A light, elegantly curved yoke was attached to the pole of the vehicle by a pin and lashings, and was attached to the two horses by means of a forked piece of wood like an inverted Y, this piece being placed astride the neck in front of the withers and lashed to the yoke.

From their behavior he rated the actinic effect of the light as equal to that obtained from an exposure of about 1/500 part of a second in bright sunlight.

The popular impression as to the duration of the lightning flash is that it is practically instantaneous. From the experiments of Wheatstone and others with the rotating disk, the duration of the flashes measured would vary apparently from the 1/1000 to the 1/10000 of a second. Others estimate the duration of the flash as even shorter than these figures.

tions, into tubes containing Koch's nutritive gelatine. The seeds continued to develop normally, without liquefying the gelatine, which constitutes, according to Koch, an infallible criterion of the absence of bacteria. Sprouted seeds, introduced into sterilized plum juice, continued to grow, without showing any bacteria in the liquid. Although these experiments can hardly be considered as decisive, they lend great probability to Laurent's opinion that bacterial intervention is not necessary.—*Bul. de l'Acad. Roy. de Belg.*, No. 7, 1885.