

tarily preserves the interior registering of the last act that strikes it, and the observer will be easily able to find this vision there.

At the same distances of observation, or at distances that may be less, photography, on the contrary, very exactly retains the definition of a movement that is executed in less than one twenty-five thousandth of a second, if need be. It results that, with respect to the latter, the human mind scarcely conceives of anything more than a union of motions—a synthesis, because the instrument at its service, the eye, permits it to see merely a grouping and not to decompose them habitually. Besides, the education of the eye by the works of the majority of painters and sculptors, almost all of whom still work upon conventional types as yet little studied, causes it to retain and understand merely conventions as destitute of truth as a representative alphabetical character could be.

Photography, on its side, registers an analysis that takes from the imagination all idea of a motion in course of execution, since the exact conception of the latter can result only from a limited succession of true positions, fused by art into a single image.

As regards the definition of the motion by the image, the eye and photography, therefore, see equally false; the first, the eye, the tool of synthesis, because, in the first place, it sees badly for want of education and training, and, second, because it sees at once too large a number of successive phases in the series of a same motion, and mixes them with each other; the second, the analyst, that is to say, photography, because it sees too quickly, and consequently seizes at once too little of the series of this same motion to allow the human mind to afterward see in these images a close relation with what the eye has made it see.

It will be concluded from this that the representation of very rapid motions, which our eye sees badly, should, in order to be true from the view point of the human mind, take account of the manner of seeing and the eye's capacity for registering, as well as of the precise data furnished by photographic analysis. A fusion between these documents, under the dominant idea that they are destined to be appreciated by the human eye, is therefore necessary, and it is here that art must intervene. Photography will furnish the latter simply, with documents of exploitation, data whose strict reproduction would be as false from the view point of the eye as ugly from the view point of art. But we must hasten to add that the human eye, imbrued for centuries by the works of artists and by itself, if it preserves a just feeling of what is adapted to it, has not yet obtained its education. It now likes and appreciates only the illusions concordant with the conventions that it knows, that it has alone retained and that it believes in good faith to see and to find again in reality.

It is therefore necessary to train it and exercise it to see more accurately, more truly, and art must impose its rule, so that new and true synthetic conventions shall finally replace the ancient and false ones. The reproduction, by quadrupeds in motion, of the figures that the latter have engendered will always, in fact, present for the majority of them the capital defect of corresponding to none of the times of any motion whatever and of being materially irrealizable.

It may therefore be foreseen that the simple types that art will retain for the representation of gaits will result from complete knowledge, and then from the fusion of the images in series furnished by photography. In its study of nature, it will take them as guides for better interpreting the acts of motion.—*La Nature.*

Fires in "Sky Scrapers."

At a recent fire the Chicago firemen demonstrated at the Masonic Temple their ability to cope with fires in the upper stories of the tallest buildings. Engine No. 1 of the city fire department pumped a stream of water through 500 feet of hose and standpipes to the roof of the building, where there was sufficient force to drench the roofs of neighboring buildings. The water pressure at the engine was 240 pounds. On the roof at the same time the pressure was 54 pounds to the inch.

The length of the standpipe from the ground to the roof of the Masonic Temple is 323 feet. The sight of an engine and firemen at this sky scraper attracted a crowd of people who were well soaked for their curiosity.

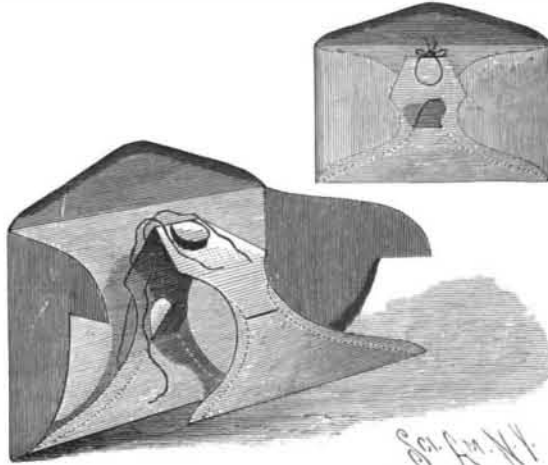
The result of the test was gratifying to Chief Swenie of the Fire Department and to the insurance men present.

Cracked by Earthquake.

One effect of the recent earthquake in Cincinnati and the surrounding country is just coming to light. Notwithstanding the recent heavy rains, it has been discovered that many cisterns are still as empty as during the long dry spell. Investigation shows that the cement was cracked in hundreds of cisterns, rendering them practically worthless.

A REINFORCED ENVELOPE.

An envelope having a reinforce or attachment applied at its back, for the securing of money or valuable papers in the envelope, and to facilitate opening it, is shown in the accompanying illustration. The improvement has been patented by John F. Forsyth, and is being introduced by Forsyth, Fields & Company, of Bloomington, Ind. The body or main part of the envelope is made in the usual way, but the side flaps fold and are gummed over the bottom flap, and a reinforce of similar form to the bottom flap is made integral therewith, folding back from its top edge, as shown in the larger view, and adapted to be sealed down upon the side flaps. In the reinforce is a transverse slot which receives a tongue projected through it from the inner flap, this tongue constituting a pull



FORSYTH'S ENVELOPE.

piece for tearing open the envelope on lines of perforation indicated by the dotted lines. A small gummed flap at the middle of the reinforce is adapted to receive and be sealed upon the tied ends of a tape or string with which money or papers in the envelope may be bound.

Oil Prospectors on the Jordan.

According to consular reports, it is the intention of the Turkish authorities, at Jerusalem, to establish a steamship line on the Dead Sea. The existence of asphalt in that region has been ascertained, and it is supposed that petroleum will be found also. A rational development of the Jordan Valley from Lake Tiberias down, and especially the opening up of the rich mineral resources of the Dead Sea basin, is considered a very profitable undertaking, for which, however, foreign capital will hardly be found, as the legal status of property holders in those regions is very unsafe.

AN IMPROVED TELEPHONE TRANSMITTER.

The illustration represents different forms of telephone transmitters for which two patents have recently been granted to Ignatius Lucas, of Passaic, N. J. The improvements are designed to soften the sounds for transmission, and render them uniform and perfect, even if the transmitter is located in a building where there is much noise and jar. As shown in Figs. 1 and 2, the transmitter has the usual casing, and the diaphragm has a point engaging the upper contact disk, made of carbon, and placed opposite a



LUCAS' TELEPHONE TRANSMITTER.

lower disk, but both disks are embedded in a filling of loose material, preferably of sliver, or wool as it leaves the carding machine and previous to being felted. The filling is preferably held on a false bottom plate adapted to be adjusted until the desired sound quality is obtained. As shown in Fig. 3, the disks or buttons are similarly embedded, but between them are placed a doubled up sheet of conductive material, such as wire netting, coated on its surface with granulated carbon, the carbon surface being in contact with the inner surfaces of the buttons. Fig. 4 shows a sheet of this material, the granulated carbon being attached in an even layer by a suitable adhesive, such as collodion.

Rose from the Ranks.

Mr. Chauncey M. Depew lately visited the Mechanical Department of Cornell University. He found at the head of it Professor Morris. The latter claimed him as an old acquaintance.

"How's that?" said Mr. Depew.

"I used to work for the New York Central Railroad," was the professor's answer.

"Indeed! in what department?"

"Oh, just in the ranks."

"How did you get on there?" asked Depew.

"I was first a fireman on an engine. That was a tough job, but it led up to the position of engineer. I made up my mind to get an education. I studied at night and fitted myself for Union College, running all the time with my locomotive. I procured books and attended as far as possible the lectures and recitations. I kept up with my class, and on the day of graduation I left my locomotive, washed up, put on the gown and cap, delivered my thesis, and received my diploma, put the gown and cap in the closet, put on my working shirt, got on my engine, and made my usual run that day."

"Then," said Depew, "I knew how he became Professor Morris."

That spirit will cause a man to rise in any calling. It is ambition, but it is ambition wisely directed, seeking to make one's self fitted for higher work. When this is accomplished, the opportunity for higher work is sure to come.

A Fire Ball.

A recent number of Nature gives the following:

In compliance with a wish expressed by several scientific friends, I place on record an instance of damage done by a fire ball or globular lightning. About five weeks ago, when I was in Londonderry, the circumstances were related to me by Mr. James Harvey, of Northland Road in that city. Mr. Harvey was staying during the month of August at Cuidaff, on the north coast of Donegal; and on the 24th of that month, at about 4 P. M., a little boy named Robert Alcorn, whose parents occupied a house near Mr. Harvey's, was desired by his father to go into the yard and drive away some fowls from the door. On going out of the house, the boy saw a large bright object in the sky about the size of the table in his bed room (I give his own account, leaving out necessary considerations of distances, etc.), or apparently about six square feet in area. The object came toward his house from the west or northwest; and when it came close, it partly burst with a report like that of a gun. He put his hands over his face to shield himself from "the spark," and after the explosion the bulk of the ball appeared to continue its course toward the east, low down. When it burst, however, it struck him, shattering the thumb and the first and second fingers of the left hand, cutting, scratching and blackening the right hand and left cheek, and shattering into fragments several bone buttons on his coat. Very soon afterward, Dr. R. Young, of Cuidaff, and Dr. Newell, of Moville, attended the boy, and amputated the fingers and a portion of the thumb.

No one near the place saw the ball (except the boy, of course), but the parents and several others heard the report, and the boy's father rushed out immediately and caught his son as he was falling. Mr. Harvey soon afterward examined the place, and could find no further trace of the fire ball, except that a piece of bark had been knocked off a small tree within a few feet of the place where the boy was struck. The local police made exhaustive inquiry as regards the possibility of any one's having fired a gun at the boy, or of his having had any explosive in his possession; but nothing of the kind transpired.

It is well to add that at Redcastle (about eight miles away), one of the residents saw, on the same day, a bright object in the sky, which object he took to be a fire ball. The day was stormy, with heavy showers, but no thunder.

M. Jamin relates ("Cours de Physique," tome premier, p. 470) several instances of globular lightning, and from these I select the following as bearing, perhaps, the greatest resemblance to the above case as regards atmospheric conditions:

"A la suite d'un violent orage observé près de Wakefield, le 1er mars 1774, lorsqu'il ne restait plus dans tout le ciel que deux nuages peu élevés au-dessus de l'horizon, M. Nicholson voyait à chaque instant des météores semblables à des étoiles filantes descendre du nuage supérieur au nuage inférieur."
October 28. GEORGE M. MINCHIN.

The Fastest Regular Train in the World.

The Empire State express now holds the world's record as the fastest regular passenger train. The speed of the best trains of foreign nations is: England, 51.75 miles per hour; Germany, 51.25; France, 49.88; Belgium, 45.04; Holland, 44.73; Italy, 42.34; Austria-Hungary, 41.75. America now heads the list with 53.33 miles per hour to the credit of the Empire State express. This is the speed now made between New York and Buffalo.