

Improved Steam Pipes.

To obviate the risks of careless brazing, and enable the thickness of sheet copper forming the pipe to be reduced to a minimum, at the same time that full advantage of wire winding is secured, a patented system of manufacturing steam pipes is at the present time being experimented with by a West of Scotland firm. It forms even a closer analogy to the wire gun than the present system of wire winding, and consists in using copper of the thinnest practical gauge, to form the interior or core of the pipe, the body of the pipe proper being composed of steel wire wound closely round the core, and the interstices between the coils being filled in solid with copper by a patented system of copper electro-deposition. Pending this and other possible improvements on copper pipes, one result of past experience with these is to give an impetus to the use of lap-welded wrought iron pipes. In the new Cunard steamers, *Campania* and *Lucania*, the main steam pipes are of this type, and experience with these so far bears out the contention of some engineers, that for modern high pressures they are, on the whole, the best that can be used.

TO SET FIRE TO A PILE OF SNOW.

When you go out in winter while there is snow on the ground, says *La Science en Famille* to its boy

**SETTING FIRE TO A PILE OF SNOW.**

readers, do not forget to put a few bits of camphor in your pocket. They will prove useful to you for playing an innocent little trick that will surprise your companions, whom you have previously told that you are going to set a pile of snow on fire.

After gathering a small quantity of snow and arranging it in a conical pile, place in the summit of it the few pieces of camphor in question, the color of which will sufficiently conceal them, and which will pass unperceived unless a very close-by observation is made.

Now apply a lighted match to the camphor and the latter will immediately take fire and burn with a beautiful flame, to the great surprise of spectators who are not in the secret.

The Colossal Passenger.

An account is given in the *Daily Telegraph* of a cattle dealer from the department of the Seine et Marne, a phenomenally stout man, who had driven into Paris, and as his horse was taken ill during his stay in the metropolis, resolved to leave the animal and return home by rail. He bought a ticket at the Vincennes station, but all his efforts to effect an entrance into a compartment proved abortive. The company's employes went to his assistance, and he was pushed and squeezed, almost denuded of his garments, but all to no purpose. The train was soon to start, and the scene had been watched with no little amusement by a number of passengers. "Well," said the cattle dealer to the station master, "the regulations have not settled the dimensions of the travelers. I have my ticket and you must take me." The distracted official now proposed that the colossal passenger should make the journey in a luggage van. The offer was accepted and soon afterward the train was speeding on its way with the cattle dealer seated on a big box in the van, which had been covered for his special behoof with a comfortable cushion.

PROF. ZUNTZ has made experiments with a Pettenkofer respiration apparatus at Gottingen, on the respiration by the skin and intestine of the horse. He first of all found that the total output of carbon dioxide in twenty-four hours was 4,200 grm. Excluding that from the lungs, the remainder due to the skin and intestine amounted together to 145 grm., and an additional 22 grm. from volatile hydrocarbons. The latter can only be methane, and hence come from the intestine. Now since the gases of the intestine have a constant composition as regards methane, carbon dioxide and hydrogen, it became at once possible to calculate how much carbon dioxide comes from the skin and how much from the intestine.

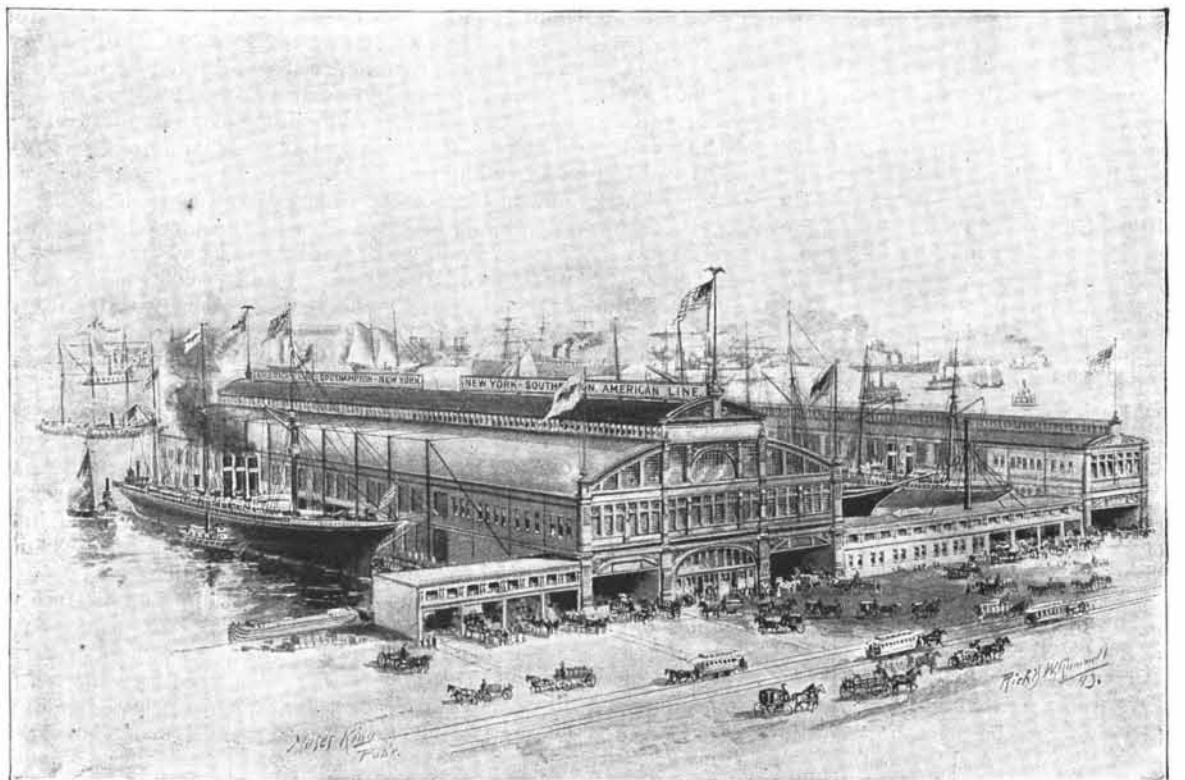
Lightning Photography.

An ingenious method of photographing the spectrum of lightning is proposed, says *Nature*, in the current number of *Wiedemann's Annalen*, by G. Meyer. The difficulty of directing the slit of the spectroscope upon the flash is got over by substituting a diffraction grating for the prism. A grating ruled on glass is placed in front of the object glass of the apparatus, the object glass being focused for infinite distances. Under these circumstances several images of the flash are obtained, a central image produced by the undiffracted rays, and images of the first and higher orders belonging to the diffraction spectra. The number of images of each order corresponds to the number of lines in the spectrum of the lightning. The arrangement was tested during a night thunderstorm. Two plates were exposed in a camera with a landscape lens of 10 cm. focal length, provided with a grating with 40 lines to the mm. One of the plates showed two flashes with their diffraction images of the first order, but representing one line only. The other showed a number of flashes, and one very strong one, passing apparently between two chimney pots, with its diffraction images well marked. A calculation of the wave length of the light producing these images gave 382μ . The measurement was not sufficiently accurate to warrant an identification of this line with a known wave length, but it is certain that a radiation of about this wave length must be added to the lines determined by Schuster and Vogel. It is probable that with better apparatus the method may be made to considerably increase our knowledge of the ultra-violet spectrum of lightning.

NEW PIER FOR THE AMERICAN LINE.

The recently completed pier for the American Line steamers Paris and New York, sailing between New York and Southampton, shown in our illustration, is said to be the most perfectly equipped as well as the largest pier in this country. It is on the west side of the city, between Dey and Vesey Streets, and extends 720 feet into the river, with a uniform width of 125 feet. It has been leased from the city for ten years at an annual rental of \$50,000, and the company has built upon it an enormous two-storied "shed," so called—a masterpiece of light but solid iron work—for the convenience of passengers and the handling of freight. The building is the full width of the pier and extends to within 125 feet of the river end. The second floor will be wholly given up to cabin passengers, who will reach it directly from the main decks of the steamers and avoid the nuisance and discomfort of being indiscriminately mixed up with baggage, freight, cabs, trucks, etc. At the eastern end is the grand stairway, leading by low, wide steps from the floor below, and a passenger elevator. Here, also, are the waiting rooms and offices, finished in hard natural wood and fitted with all the modern conveniences that one sees in well appointed railway depots. The lower floor, at the street level, is given over to freight and the offices of the shipping department. The whole cost of the building and fixtures is over \$300,000. It has a Sturtevant hot blast apparatus for heating and ventilating the offices, and the electric plant comprises two dynamos of 400 sixteen candle power lamps each and two 50 arc light dynamos.

For our illustration we are indebted to the *Electrical Engineer*, New York.

**THE FINE NEW PIER FOR THE AMERICAN LINE STEAMERS PARIS AND NEW YORK.****A MIRROR ATTACHMENT FOR BICYCLES.**

A device to enable bicycle riders to observe vehicles, etc., approaching from the rear, without being obliged to turn and look back, is shown in the accompanying illustration, and has been patented by Mr. K. F. Bucherer, No. 411 East Ninth Street, New York City. The attachment consists of a yoke-shape or arch bar fastened onto the handle bar of the bicycle by means of two clamps, and supporting a mirror, which is hinged to a V shaped keeper, so that it can be moved up or down the standard bar by pressing the two ends of the keeper together, and releasing at the desired

**BUCHERER'S BICYCLE MIRROR.**

height. The mirror itself may be placed at the inclination desired for distance or nearby observation by simply pressing it in the desired position, where it will be held by pawls catching into the toothed keeper. The adjusting of the mirror to the proper place can be done with one hand only while riding. All the parts of this bicycle attachment are very simple and not liable to get out of order.

The Geologic Age of the World.

Prof. C. D. Walcott expresses the opinion—contrary to that entertained by some scientists—that geologic time is not to be measured by hundreds of millions of years, but simply by tens of millions. This is widely different from the conclusion arrived at by Sir Charles Lyell, who, basing his estimate on modifications of certain specimens of marine life, assigned two hundred and forty millions of years as the required geologic period; Darwin claimed two hundred million years; Crowell, about seventy-two millions; Geikie, from seventy-three million upward; Alexander Winchell, but three million; while McGee, Upham, and other recent authorities claim from one hundred million up to six hundred and eighty million. The data presented by Dr. Walcott, showing the distribution of geologic time, or the different periods of sedimentary rocks, give two million nine hundred thousand years for the cenozoic and pleistocene, seven million two hundred and forty thousand for the mesozoic, seventeen million five hundred thousand for the paleozoic, and a like period to the latter for the algonkian—a total of forty-five million five hundred thousand years.