

## PHOTOGRAPHIC NOTES.

**Improved Distance Measurer.**—At a meeting of the Photographic Society of France, M. Lemerrier exhibited a novel attachment to a camera, for quickly ascertaining how far objects were from the camera. The device consisted of a V-shaped jaw on an acute angle placed horizontally on the front portion of the top of the camera, and connected by a system of levers to the lens, so arranged that when the lens is drawn in or out for focusing, it will automatically open or close the jaws.

If an object is 200 feet distant, the lens is moved until an accurate focus is obtained, and a corresponding mark is made on the jaws. When the ground glass is removed, focus is obtained by operating the lens until the object can be plainly seen between the jaws at the 200 feet mark. Other marks for different distances are made on the jaws. A peculiar advantage of the device is that it enables one to determine how far off a man is from the camera. If, when the jaws are wide open, the head and feet are just included in the space between the outer extremities of the jaws, then the man will be ten yards distant. If his image be so small as to come within a mark near the apex of the jaws, then he will be 200 feet distant. The operator stands behind the camera, and looks through and against the side of the jaws.

**Diffusing Light in Studios.**—Frequently there is need of diffusing light in studios, either from the direct rays of the sun or from the reflection of colored light from high buildings. Waxed tissue paper has been found to be one of the best mediums for this purpose, since it allows a large percentage of light to pass, and at the same time it is the latter is equally diffused. Pictures may be made as quickly as if there was no medium interposed. Thus we have a new use for waxed paper, in the manufacture of photographic screens.

**Removing Pyro Stains from the Fingers.**—The *British Journal of Photography* says this is easily done by moistening the hands with a dilute solution of almost any acid—hydrochloric, nitric, oxalic, citric, etc. After cleansing in this manner, the hands must be freely washed in hot water. If this precaution is not taken, the stains will reappear under the use of soap and water.

## Something New about Bees.

At a recent meeting of the Royal Microscopical Society, Mr. F. R. Cheshire called attention to some specimens of bees, known as "fertile workers." It was generally well known that in the beehive all the eggs were usually laid by the queen, and in her absence no ovipositing occurs until they have taken some of the eggs remaining in the hive, and by a special feeding of the larvæ have been able to produce fresh queens. If, however, it should happen that in a hive which has lost its queen there are not eggs available for this purpose, it was found that some of the workers under some special circumstances, which could not be very clearly explained, became capable of laying eggs, but that such eggs produced drones only. These bees were known as fertile workers, and though there could be no doubt as to their frequent existence, they were very difficult to catch, owing to their being the same in appearance as the ordinary workers. He now exhibited two of these fertile workers having the ovaries drawn out of the bodies, and attached to the stings and abdominal plates, so as to show that they really were workers. There was a remarkable peculiarity to be observed in connection with the ovarian tubes of these insects—every ordinary worker possessed an undeveloped ovary which it was very difficult both to detect and dissect; but when under the influence of some stimulus the worker became fertile, a number of points began to appear in the tubes which afterward became developed, and it would seem that the eggs were developed in alternation, an examination of the tubes showing them to contain developed eggs alternating with others in an undeveloped condition, and of which some very curious instances were seen in the specimens before the meeting.

## "The Spectacle Mission."

A provincial contemporary contains an account of a new missionary enterprise—one for distributing spectacles among the poor. This may seem at first sight a very prosaic thing to do, but we recognize in it the very genius of kindness. "I was eyes to the blind" was one of the most excusable boasts of Job in his moments of pardonable complacency. Such may be the satisfaction of Dr. Edward Waring, of Maida Vale, who is credited with initiating this piece of benevolence among the inmates of St. Giles' Workhouse and the Cleveland Street Sick Asylum years ago. Such a service implies much trouble and time. It is of little use to supply spectacles to the poor without much personal trouble to suit the glasses to sight. We can only hope that Dr. Waring's example will be fruitful, and that the intolerable irksomeness of life in those who have the disposition to work without the means of doing so will be extensively mitigated.—*Lancet*.

## A Curious Explosion.\*

A few weeks ago we had a curious explosion here, which is, I think, worthy of record, in order that similar occurrences may be guarded against in future. What exploded was a steel cylinder which was being charged with oxygen gas in the basement of the School of Science building. It was one of the so-called forty-foot cylinders made by the New York Calcium Light Company, and was intended to be charged to a pressure of fifteen atmospheres. It had been regularly used at that pressure for a year or two. At the time of the explosion the pressure was only about ninety pounds, as shown by a pressure-gauge connected with the apparatus. This gauge had been duly tested only a week or two before, and found correct. The oxygen was being pumped into the cylinder from the gasometer by an ordinary force-pump, furnished for the purpose by the makers of the cylinder, and driven by steam power at the rate of about eighty strokes per minute. The lower portion of the cylinder was immersed in a vessel of water, to keep it cool; and the pump piston was lubricated with a heavy mineral oil, such as we are accustomed to use in the steam engine cylinder. The seat of the lower valve is of hard rubber, and had just been faced off, so that the pump was in exceptionally good order, and working very effectively. The connection between the pump and cylinder was by a heavy lead pipe of about a quarter-inch bore, and about five feet long.

At the time of the explosion two persons were in attendance, one of them Mr. Fisher, the mechanic of the School of Science, in charge of the machine shop, who stood by the pump watching the pressure-gauge; and the other his assistant, standing by the cylinder itself. Suddenly a flame, blue or green, and some three or four inches long, made its appearance on the top of the cylinder, where the lead pipe was coupled to the stop-cock. The young man at once reached out with his hand to turn the wrench (which was in its place, on the top of the cylinder), in order to prevent any loss of gas; at the same time naturally turning half round away from the cylinder, stooping a little. Before he could turn the wrench, the thing exploded, with the noise of a six pounder gun. The cylinder tore in two about six inches from the bottom. The upper part flew up, striking the floor of the mineralogical cabinet above, giving such a blow as moved some of the cases several inches, and shook the specimens completely into *pi*. The glass of every window in the basement was blown out, the plastering was knocked down, and the whole establishment was pretty thoroughly wrecked. Strange to say, neither of the men was much hurt. Mr. Fisher had his eyebrows singed, and a piece of the cylinder nearly as large as one's hand was shot through the brim of his hat, passing within an inch of his forehead. The assistant was sent flying, head first, nearly twenty feet, against the gasometer tank. Of course, he was a good deal bruised and shaken, but fortunately not seriously injured, not enough to confine him to his room even for a single day.

Somewhat similar explosions, but much less violent, had occurred two or three times before, always in charging the oxygen cylinder; but the damage done had never been anything more than blowing off the lead tube from its connections, or bursting it. I learn also that something of the same sort is not quite unknown in the pumping rooms of the establishments which deal with the gases on a large scale.

Now, as to the explanation. My theory is this, and several eminent chemists and physicists to whom it has been proposed accept it, while none, so far as I know, reject it. The explosion was probably due to the firing of oil spray, and possibly a little oil vapor mixed with the oxygen gas. The inside of the cylinder after the explosion was found to be covered by a film of oil, which undoubtedly came from the pump cylinder, and was forced into the pipe along with the gas; a little puff of gas and oil spray passing through the valve at each stroke of the piston.

Now, oil in pure oxygen will, of course, burn with extreme violence and the evolution of great heat, if anything sets it on fire; and though the immediate effect of such firing might not be an explosion quite in the sense of an explosion of gunpowder or dynamite, yet it is certain that the sudden and intense heating of the gas in the cylinder would immediately raise the pressure, already ninety pounds by the gauge, to three hundred or four hundred pounds, and quite beyond the strength of the metal. The fact that the young man was not torn to pieces, but simply pushed and thrown, corresponds to an explosion of the kind indicated. At the same time, the fact that the hand with which he tried to turn the wrench was slightly singed, shows that fire was present. It was not merely a case of a cylinder weakened by age and rust bursting under a pressure it ought to be able to bear.

The firing of the mixture of oil and gas was unquestionably due to the sudden pressure produced at the lower valve of the pump by each piston stroke. It will be remembered that the seat of this valve was of vulcanite, a very poor conductor of heat; so that,

although the bottom of the cylinder was kept fairly cool by the vessel of water in which it was immersed, yet there was nothing to prevent the gas itself, just at the valve, from becoming very hot, and even rising above the temperature of ignition, if at any time, during a stroke or two, the valve happened to stick a little.

The moral is simply this: Do not lubricate an oxygen pump with oil, but with soap suds or something that will not burn in oxygen.

## Killed by an Orange Seed.

Henry Chatfield, of 115 Henry Street, Brooklyn, the head of the hosiery department of a Fulton Street notion store, died May 29 of the effect of the lodgment of an orange seed in his intestines. He had been ill for several weeks with inflammation of the intestines, followed by ulceration. Dr. Emerson, his physician, called in Dr. William Gilfillan for consultation, and they, having decided that an operation was necessary, procured the assistance of Dr. F. H. Colton. On the morning of May 29 the three doctors made an incision, and after removing a quantity of pus found the source of trouble and removed it. The patient, however, was unable to rally from the shock, and died about 4 o'clock. Dr. Gilfillan said:

"The operation was a desperate one, and was undertaken only as a last resort. There was no possibility of saving the patient otherwise. The orange seed was found lodged in the appendix vermiformis. This is a small sac that is attached to one part of the intestines. What purpose it serves is not exactly known. It is, however, a sort of trap, always ready to catch and hold hard substances passing through the intestines. The lodgment of such substances in it is not invariably fatal, but the exceptions are rare. Seeds of oranges, rasins, and similar fruits are peculiarly liable to be caught in this way. Is it dangerous to eat oranges? Well, I suppose in a city of this size there is one case a year of death from such a cause. Very frequently it is an orangeseed, but not always. There are about 600,000 people in Brooklyn, all eating oranges right along, and with one death a year from this cause it would seem to be about as dangerous to eat an orange as to sit in the house and wait for a stray pistol ball to kill you. Still, it's just as safe, and a good deal nicer, not to swallow the seeds when you eat oranges."—*N. Y. Sun*.

## Influence of the Degree of Rarefaction on the Efficiency of an Incandescent Lamp.

In the manufacture of lamps, the photometric researches by Sig. Heess, applied to some Swan lamps where the rarefaction of the gas was made to vary from a maximum obtainable with a mercurial air pump down to 2 mm. (10-125 inch) by a mercury gauge, are of much interest. It was ascertained that naturally the illuminating power for a given quantity of electric energy was highest when the highest vacuum obtainable was produced. As the pressure was allowed to increase, the light diminished; but at first the decrease was slight, so that the luminous intensity was nearly equal to the maximum value until the pressure exceeded 2 mm. (10-125 inch). Increasing the pressure beyond this point, the luminous intensity rapidly decreased, until it became reduced to two-thirds of its original value, when the pressure increased from 2 to 6 mm. (¼ inch).

Sig. Heess concludes that to obtain from a lamp a good luminous efficiency, the tension of the gas should not exceed 2 mm. The author notes that while the experiments were conducted with the Swan lamp, it is probable that the results would apply to lamps of other types. In any case, the result of these experiments should be placed on record, because in judging of the expediency of pushing the exhaustion of an incandescent lamp to certain limits, not only the luminous efficiency, but other circumstances also, have to be taken into consideration.—*G. G., in L'Industria*.

## Deaths of Eminent Foreign Medical and Scientific Men.

The deaths of the following foreign medical and scientific men are announced: Dr. W. Hack, Professor of Laryngology and Dermatology in the University of Freiburg in Baden, was recently found dead, apparently from heart disease, upon his tricycle, which was standing in the middle of the road near Staufen in the Untermunsterthal.—Dr. Max Geminger, Conservator of the Munich Zoological Museum, and a well-known entomologist.—Dr. Joseph Lerch, Extraordinary Professor of Zoology and Director of the Zoo-chemical Institute in the German University of Prague.—Dr. Vladimir T. Horschelmann, Privy Councillor, and late holder of a high position in the St. Petersburg district, Military Medical Staff. At the time of the Crimean war he was senior surgeon of the Preobrashenski Regiment.—Dr. Edward Meyer, who is described as the Nestor of Livonian practitioners, being at the time of his death eighty-two years of age, and having taken the M.D. degree at Dorpat in 1827.—Dr. Hellinger, one of the oldest and most respected medical officials in the Rhine provinces.—*Lancet*.

\* By Professor C. A. Young, in *Popular Science News*.