Science Notes.

M. Levassor, who was widely known in connection with the horseless carriage movement, died recently, at the age of 54. He drove the winning vehicle from Paris to Bordeaux and back in the famous race.

There is certainly something odd about the element cerium, says the Progressive Age. M. Schutzenberger, a well-known French chemist, has shown the Academie des Sciences that monazite sand yields three different ceriums, agreeing in spectroscopic character and in the ordinary reactions of cerium, but not in all chemical respects, and having the respective atomic weights of 138, 148 and 157.

The buildings of the New York Botanical Garden, with approaches and surroundings, cover twenty-five acres. The pines and other coniferous trees will occupy thirty acres; seventy acres will be devoted to deciduous trees; twenty-five acres will be left as a natural forest; shrubs and small trees will occupy fifteen acres; eight acres will be devoted to herbaceous ground for scientific arrangement; the bog garden will occupy five acres; lakes and ponds six acres; and meadows ten acres. The museum building will have a frontage of 304 feet, with two wings, each 200 feet in length.

Mr. Oliver C. Farrington writes to Science, sending a reproduction of a school geography's picture of Popocatepetl, and by the side of it an outline of the actual mountain. The difference is quite startling. The slope of Popocatepetl was found by Mr. Farrington to be never more than 30 degrees, while the picture represents a snow-capped peak with a slope of from 40 to 50 degrees. "A tall cross, such as no traveler in Mexico ever saw, and luxuriant palms, such as never grow at the altitude from which Popocatepetl can be seen," furnish a fitting foreground for a picture so unfaithful to the literal facts of the region.

A fur seal has none of the altruistic instincts of some other animals, for she will never feed any pup but her own, says the Popular Science Monthly. Not a very affectionate mother at best, she yet unerringly knows her nurseling's voice, and he in turn learns to find her. When they meet and recognize each other at meal time, it is easy to see that they belong together. Her duty done, however, she lets it shift for itself till the next feeding time. She instantly knows any little hungry intruder that is stealing up to her to get a meal on the sly. She cuffs and bites, until the starveling, intimidated, slinks away to die. These orphaned younglings are the fruit of the indiscriminate "pelagic" sealing. Their mothers being killed, and they unable to obtain another nurse, they perish by the thousands. A United States report estimates the number for 1896 at 20,331.

Considerable misconception prevails as to the manner in which the ostrich runs, says the Zoologist. It seems to be still generally held that when running it spreads out its wings, and, aided by them, skims lightly over the ground. This is not correct. When a bird really settles itself to run, it holds its head lower than usual, and a little forward, with a deep loop in the neck. The neck vibrates sinuously, but the head remains steady, thus enabling the bird, even at top speed, to look around with unshaken glance in any direction. The wings lie along the sides about on a level with, or a little higher than, the back, and are held loosely just free of the plunging "thigh." There is no attempt to hold them extended or to derive any assistance from them as organs of flight. When an ostrich, after a long run, is very tired, its wings sometimes droop; this is due to exhaustion; they are never, by a running bird exerting itself to the utmost, held out away from the sides to lighten its weight or to increase its pace. But the wings appear to be of great service in turning, enabling the bird to double abruptly even when going at top speed.

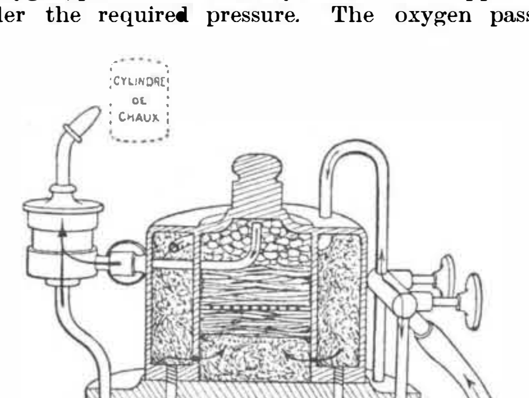
According to the Bulletin of the Belgian Astronomical Society, says the Literary Digest, recent experiments in Styria on the breaking up of hail storms by the firing of guns have met with remarkable success. "M. A. Stiger, burgomaster of the city of Windisch-Feistritz, and proprietor of extensive vineyards, having replanted a part of his land on the Schmitzberg, took the following precautions to preserve the young plants from hail storms, to which this region is exposed. Over an extent of about six kilometers (3·7 miles), at elevated points, he built six iron structures, each holding ten large mortars; at some distance from each of the structures he located a hut to be used as a powder magazine. M. Stiger then organized a body of volunteers composed of the inhabitants of the neighborhood, so that each post could in case of necessity be manned by six persons. In the course of last summer the residents of Windisch-Feistritz were able to make their first experiment. Masses of black and threatening clouds approached from the neighboring mountains. At a given signal the discharge of the sixty mortars began. After some minutes the clouds could be seen to pause, break up and disperse without letting down either hail or rain on the protected region. The experiment was repeated in the course of the same summer, taking place six times and always with the same success. The efficacy of the discharge extended over about one square mile."

THE PROBABLE CAUSE OF THE GREAT PARIS FIRE.

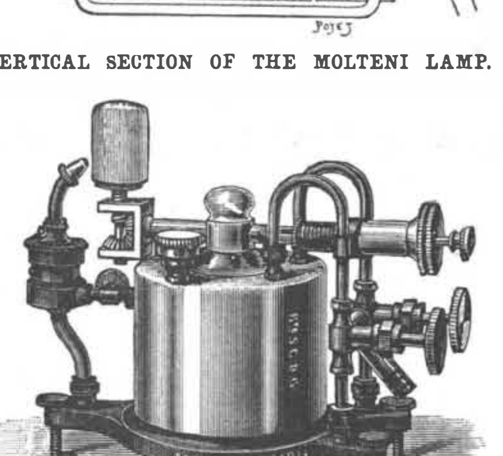
If the most contradictory, most fantastic and uselessly complicated theories have been conceived regarding the way in which the fire of the charity bazar at Paris could have arisen in the cinematograph room, it is surely because the action of the lamp which was used to project the images on the screen was not sufficiently considered.

The management of the cinematographic performances of the charity bazar had at its disposal neither electric light nor a gas supply for the oxyhydrogen flame. They had then to resort to a Molteni lamp, whose flame can be fed indifferently, either with ether or with gasoline. Our cuts represent the aspect of the externally visible parts of the lamp, and also a vertical section.

Such a lamp consists first of a cylindrical bronze box, ten centimeters in diameter, filled with some absorbent, such as pieces of pumice stone or felt, intended to store and keep the liquid used. Since the apparatus is completely stuffed with such material, no space in the interior can, by permitting the collection of free liquid, form a reservoir for explosion in case the flame should beat back. This is simply the principle of the Pigeon lamp, and of all lamps for home use with mineral fuel. The only difference lies in the method of bringing the combustible fluid to the jet where the flame is to burn. In the Molteni lamp, instead of a wick acting by capillary attraction, we have a stream of oxygen, provided from a cylinder which supplies it under the required pressure. The oxygen passes



VERTICAL SECTION OF THE MOLTENI LAMP.



THE MOLTENI LAMP FOR ETHER AND OXYGEN.

through the box, which, for saturating purposes, is divided into two concentric compartments, circulates through the absorbent, saturated with gasoline or ether, and, charged with inflammable vapor, escapes by a blowpipe. After passing through the saturator at the top, as shown by the curved pipe in the upper illustration, the enriched gas is mixed again with a second stream of pure oxygen coming directly from the cylinder, and shown in the lower pipe under the saturator, which, when ignited at the end of the blowpipe nozzle, produces a blue flame of intense heat. The flame, impinging upon the lime cylinder, heats it to incandescence at a temperature of 2,000° Centigrade, producing an intense light, equal to the well known oxyhydrogen lime light.

In using a lamp designed to burn the lighter mineral oils, greater precautions are required than those for ordinary kerosene oil.

The method of filling the Molteni lamp is to unscrew the stopper on the top, and slowly pour in 150 cubic centimeters of the liquid chosen. The lamp is then left to stand for some time, so that the absorption of the liquid may be as complete as possible. The lamp is then turned over, so that any liquid not absorbed, but freely running in the reservoir, may drain off to the last drop.

Should too much liquid be put in, when filling, there is a risk of its running over into the tubing of the lamp. Before filling there might be also some liquid left over. Finally, before lighting, it is necessary to let the oxygen pass freely for a while to dry the pipes, which might have kept some moisture.

The oxygen ether lamp—ether was used at the bazar—gives light for an hour and a half. Perhaps the one that caused the catastrophe on the 4th of May had worked beyond that time. The operators moved in a restricted space, they were unused to the locality, and hindered in their movement. Which of the precautions mentioned above did they omit? What accident, as commonplace as that which may happen in our kitchen any night, fell upon them? It is difficult to tell. Possibly as the ether in the saturator was used up faster than was expected, and as the light became weaker in consequence, the operators determined to shut off the oxygen and recharge the saturator with a fresh supply of ether.

Bearing in mind that the lime was still hot and had not been removed from its place and was quite near to the filling aperture, a drop of the ether might have spattered unnoticed on the lime and ignited.

Whether such was the case can never be known. Certain it is that those who knowingly allowed the storage of even a small amount of such an inflammable fluid as ether in such a place are open to censure.

On the other hand, the people who had raised those cardboard decorations, those hangings of light stuff, and those casements of varnished wood had not foreseen the placing there of the ether lamp. It is difficult indeed to learn just who was responsible for the catastrophe.—L'Illustration.

The Effect of Removing the Ends of a Magnet.

It is well known that when a magnet is cut so as to divide it into two parts, two complete magnets are formed, whose poles are arranged in the same way as in the large magnet before cutting. It has occurred to J. F. Smith to ascertain the effect of cutting from the ends of a wide thin magnet strips whose width is small compared with their length. His experiments are described in a recent issue of the Western Electrician, and are illustrated by diagrams showing the effect of removing the ends of the magnet in various ways. These experiments seem to indicate that when a wide thin magnet is cut or broken so that the part removed has a length greater than its width, the arrangement of the poles is different from that ordinarily obtained by cutting the magnet. On a consideration of the nature of the behavior of Faraday's lines of force, the explanation seems to be as follows: At the regions where the lines of force enter or leave the magnet the poles are located. Each line of force is a closed circuit running from pole to pole through the magnet, and making the return circuit through the air. When the magnetized strip of steel has got almost across, the lines of force are diverted from their usual path through the magnet, and are crowded together, the narrow portion joining the small strip at the end to the larger magnet. Since the strip furnishes a better path for the lines of force than the air in the gap where the metal is cut, the lines are thus shifted, so that they run lengthwise of the strip instead of crosswise. The lines of force then leave the strip at the ends or near the ends. When the small strip is being broken from the main strip, the lines of force leap across from the larger strip to that point of the small strip which is nearest the large one, and thus the formation of a separate pole begins. When they are completely separated, this lost point, at which the strips were joined, becomes a separate induced pole, permanent and of opposite kind to the adjacent pole of the larger magnet. Essentially the same thing takes place when the strip is cut from the sides toward the middle, the results being the formation of a north seeking pole at each end, while the consequent south seeking pole is induced at the middle, where the lines of force leap across from the larger magnet.

Is there any "Best" Time for Sleeping?

Does the time at which the sleep is obtained, provided it is sufficient in amount, make any change in the result? In brief, is there any truth in the old adage that an hour before midnight is worth two hours after midnight? I had an opportunity to make some study of this subject in my naval service during the late war. On shipboard, as is undoubtedly known to most of you, the ship's company—officers and men alike—stand four-hour watches day and night, and to get the required amount of rest are obliged to get their sleep irregularly; to so arrange it that the same man shall not be obliged to take early or late watches continuously, the "dog watch" of two hours is interpolated, thus adding to the irregularity. In watching the results for over two years I could never discover that the watch officers and the men were not as fully refreshed by their sleep as were the medical and pay officers, who stand no watch, and have hours as regular as those of any householder.—Dr. E. P. Colby, in the New England Medical Gazette.

IN 1896 there were imported into Germany 591,500 kilos of crude aluminum. Of these, 467,600 came from Switzerland, 55,000 from France, and 8,400 from Austria. In the first two months of the current year 138,900 kilos were imported, as against 65,900 for the corresponding month of the previous year. The importation of sheet aluminum also is rising, and the customs duties on the metal on the Swiss frontier have consequently been lowered.—Stahl und Eisen.