

than that polarised parallel to them. The contrary was observed in scratched glass gratings, while a scratched metal mirror reflected 4 per cent. more perpendicular than parallel light.—The limiting index of refraction for infinitely long waves; transformation of the equations of dispersion, by E. Ketteler. The determination of the limiting coefficient of refraction is shown to be impossible, both in practice and by the current theory. Another form of the equation of motion of light is worked out, which promises a solution of the problem.—On the electricity of waterfalls, by Ph. Lenard. Numerous observations and experiments concerning the electricity developed by water falling in drops, jets, or waterfalls have led to the following general conclusions: Drops of water falling on to water or a wetted body generate electricity. Water is electrified positively, air escapes negatively electrified from the foot of the fall. Jets breaking up into spray make the electrification more apparent. Slight impurities in the water diminish the effect considerably. Other liquids and gases also produce electrification, but differing in intensity and sign. The essential conditions of electrification are the concussions among the waters themselves and against the wet rock. The friction against the rock and the fall of the earth-potential are of secondary importance, while no effect is due to the water's fall through air and its dispersion in it. The author explains these phenomena by the sudden diminution of the water surface, and the convection of negatively charged air away from the foot of the fall. A jet of water falling from an insulated tank into an insulated pail electrified the latter positively, while the negative electrification of the surrounding air grew to several hundred volts. A steady increase of potential was also produced by drops of water falling at the rate of two per second. Sparks were sometimes obtained from waterfalls, and in all cases the air was found to be negatively charged, though this charge was diminished if air bubbles were driven under water.—Note on a phosphoroscope with spark illumination, by Ph. Lenard. This ingenious apparatus consists of a Ruhmkorff coil with condenser and mercury interrupter, fitted with terminals of strip zinc or zinc wire, in order to produce as much ultra-violet and phosphorescent light as possible. The arm of the mercury interrupter is prolonged, and carries at its end a rectangular shade of black paper, large enough, in its mean position of rest, to hide the spark and the terminals. Hence when the coil is working the sparks are not seen. But if a phosphorescent substance be placed behind the terminals, it continues to glow when the screen is at its highest or lowest position, thus producing the impression as if the screen, which appears perfectly stationary, were only transparent for phosphorescent light. For lecture purposes the apparatus is placed behind a screen with an opening as large as the black paper shade. The results are in general the same as those of Becquerel's phosphoroscope. A brilliant green light is obtained from pentadecylparatolyketone. The interval between illumination and observation is $\frac{1}{1000}$ second.—On the production and observation of very rapid electric oscillations (continued), by A. Toepler.—On the use and mode of action of the telephone for electric null methods, by A. Winkelmann.

SOCIETIES AND ACADEMIES.

PARIS.

Academy of Sciences, Sept. 5.—M. de Lacaze-Duthiers in the chair.—Note on the treatment of cancer and cholera by the testicular liquid, by M. Brown-Séquard. Some recent results seem to indicate that the testicular liquid, already proved to be efficacious in cases of pulmonary tuberculosis, leprosy, and other diseases, also exerts a beneficial influence on cancer patients. This is not due to any action upon the microbes producing the disease, but to an augmentation of the powers of the nervous system, which is enabled to resume its normal functions by subcutaneous injections of the extract. M. Ouspensky, a military physician sent by the Russian Government to study and cope with the cholera in the Caucasus, is reported to have "cured every patient" by this method. Whether or not this be true, there is no doubt that the injections strengthen the nervous system, which is much exhausted even in convalescents.—Observations of the comet Denning (1892, II.) made at the great equatorial of the Bordeaux Observatory, by MM. G. Rayet, L. Picart, and F. Courty, reported by M. G. Rayet.—Observations of the planet Mars, by M. Perrotin [see p. 482].

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—Reappearance of the leafy celandine of Pumeterre, by M. D. Clos.—Observations of the new comet Brooks (C. 1892), and of the new planet Wolf, made at the Observatory of Paris (west equatorial), by M. G. Bigourdan.—Observation of the comet Brooks (August 28, 1892), made with the Brunner equatorial (0'16) of the Lyons Observatory, by M. G. Le Cadet.—On the calculation of inequalities of a high order, by M. O. Callandreau.—On a new form of induction apparatus, by M. J. Morin. The induction coils usually employed in electrotherapy are constructed with two cylindrical and concentric bobbins, sliding one over the other, and giving the maximum effect when the coils coincide along their whole length. There is a difficulty in reaching the zero by a regular diminution of the current. This is obviated in the apparatus as constructed by M. Morin. The conducting wires are wound on two flat concentric rings provided with channels of appropriate form. When an intermittent current is sent through the outer ring induced currents will be obtained from the inner ring. The effect will be greatest when the two rings are in the same plane. If one of these rings be turned round a diameter common to both the induced current will gradually diminish, and will vanish when the one ring is at right angles to the other. This arrangement could be employed for obtaining alternate currents by sending a continuous current through one of the rings and rotating the other. A sinusoidal current would be thus generated, the effects of which have been lately much appreciated in electrotherapy. For electric lighting the number of alternations might be increased by transforming the currents into induced currents of a higher order, by Prof. Henry's method, utilized recently by M. Tesla.—Removal of the thyroid in the white rat, by M. H. Cristiani (Geneva). The apparent immunity of the rat from the fatal effects of the removal of the thyroid is shown to be due to the rapid regeneration of this organ. If the extirpation is total, death, otherwise inevitable, can be averted by grafting the organ in the peritoneum.

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