America, presented by Mrs. Dade; two Brown Mud Frogs (*Pelobates fuscus*) from Italy, presented by Count M. Peracea; an Indian Elephant (*Elephas indicus*, ♀) from India, a Rose-crested Cockatoo (*Cacatua moluccensis*) from Moluccas, deposited; a Chimachima Milvago (*Milvago chimachima*), two Violaceous Night Herons (*Nycticorax violaceus*) from South America, a Common Quail (*Coturnix communis*) captured at sea, a Common Rhea (*Rhea americana*) from South America, a Bornean Gibbon (*Hylobates muelleri*, ♀) from Borneo, purchased.

## OUR ASTRONOMICAL COLUMN.

THREE BRILLIANT STELLAR SYSTEMS.—Prof. T. J. J. See, with the aid of the 24-inch refractor of the Lowell Observatory, in Mexico, has recently discovered (*Astr. Journal*, No. 396) three objects which "may be regarded as amongst the most splendid systems in the heavens." The first, discovered in January last, is α Phœnicis, its position for 1900 being R.A. 0h. 21m. 19·5s., decl. −42° 50′ 48″·1. The primary of this double has a magnitude of 2·4, the companion being as faint as a thirteenth mag. star. This inequality, combined with the deep orange or reddish colour of α Phœnicis, renders the system both striking and difficult. The mean of some measures made for determination of the position of the components was 1897·041, pos. angle 272°·7, dist. 9″·73. The second of these objects, also a very southern star, is μ Velorum with a magnitude of nearly 3, the companion being 11, of a purplish colour and very near the large star. [R.A. 10h. 42m. 28s., decl. −48° 53′ 31″ (1900)]. This system is described as one of the most extraordinary in the heavens, and likely to have a very large orbital motion. Measurements of position gave for 1897·059, pos. angle 62°·7, dist. 2″·54. The third and last of these objects, η Centauri, situated at R.A. 14h. 29m. 10s., and decl. −41° 42′ 59″ (1900). The components are of magnitude 2·5 and 13·5, being yellow and purple in colour. The system is described as extremely difficult, requiring a powerful telescope to see it. The relative positions of the components is given for 1897·051, as pos. angle 270°·1, dist. 5″·65.

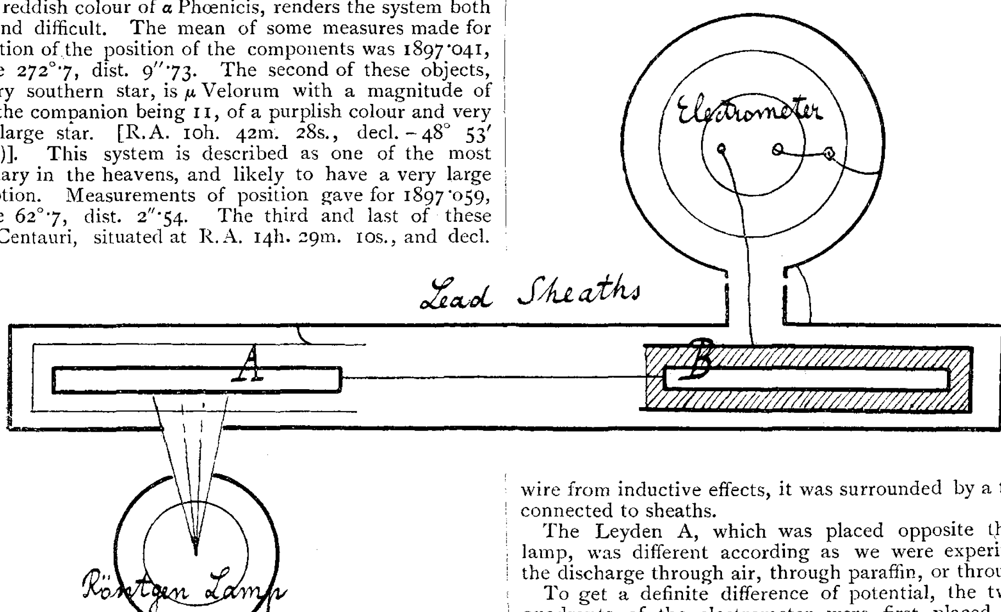
THE COMPANION TO PROCYON.—To those who wish to seek for the companion to Procyon, Prof. Schaerberle's description of the method he adopts (*Astr. Nachr.*, No. 3410) in observing this faint companion will prove of service. Owing to its very close proximity to Procyon, the companion can only be seen when the observing conditions are at their best. If a good objective be employed the aperture should not be reduced, but a cap fitted over the eyepiece is found most serviceable. For Prof. Schaeberle's measures an eyepiece magnifying 500 diameters was employed, the aperture of the cap over the eyepiece being about 1·6 millimetres. The magnitude of this companion is estimated as fully equal to a twelfth-magnitude star, and when the seeing is good it is "as easily and accurately measured as the satellite Phobos when Mars is in opposition." Sirius' companion is estimated as being two or three magnitudes brighter than that of Procyon, and is also being regularly observed at the Lick Observatory, the same means—namely, cap over the eyepiece—being employed.

## ON THE INFLUENCE OF RÖNTGEN RAYS IN RESPECT TO ELECTRIC CONDUCTION THROUGH AIR, PARAFFIN, AND GLASS.[1]

WE have in previous papers described experiments respecting electric conduction when Röntgen rays fall on metals, positively or negatively electrified to potentials of two or three volts. We found that although air is rendered conductive, paraffin and glass are not rendered sensibly conductive when the differences of potential concerned are not more than two or three volts per centimetre of air, or per centimetre of paraffin, or per half-millimetre of glass.

We have now to describe an extension of the investigation to much higher voltages, in which we use an arrangement of two (quasi) Leyden jars, A and B, with their inside coatings connected together. The outside coating of A was connected to sheaths, the outside of B to the insulated terminal of the electrometer. In all the experiments to be described, B remained the same.

It consisted of a cylindrical lead can, 25 cms. long, 4 cms. diameter. A metal bar about 1 cm. diameter, 25 cms. long, was supported centrally on paraffin filling the whole space between it and the containing lead. This metal bar was connected by a wire to the internal coating of A. To protect this wire from inductive effects, it was surrounded by a tube of lea connected to sheaths.




The Leyden A, which was placed opposite the Röntgen lamp, was different according as we were experimenting on the discharge through air, through paraffin, or through glass

To get a definite difference of potential, the two pairs of quadrants of the electrometer were first placed in metallic connection. Then one terminal of a battery or of an electrostatic inductive machine was connected to the internal coatings of the jars, and the other terminal to sheaths. The difference of potential produced was measured by a multicellular voltmeter in the case of differences under 500 volts, and on a vertical single vane voltmeter for higher differences.

When the desired difference of potential had been established, the metallic connection of the battery or electric machine with the internal coatings of A and B was broken, and this charged body left to itself. To find the loss due to imperfect insulation, the pair of quadrants in metallic connection with the outside coating of B was insulated in the ordinary way, and the deviation of the electrometer reading from the metallic zero per half-minute was observed. To find the loss when the rays were acting, the two pairs of quadrants were again placed in metallic connection, the Röntgen lamp set a-going, then the pair of quadrants connected to the outside coating of B was insulated from the other pair, and the deviation from metallic zero again observed per half-minute.

In the experiments with air, the Leyden A consisted of an aluminium cylinder, 16 cms. long, 3 cms. in diameter. This cylinder projected beyond the lead tube, and was connected to sheaths. The insulated metal inside it, which was a flat strip

[1] By Lord Kelvin, Dr. J. Carruthers Beattie, and Dr. M. Smoluchowski de Smolan. Read before the Royal Society of Edinburgh, March 1.