describes the base and its salts derived from toluene, analogous to the compounds previously described by Prof. Meyer and Herr Hartmann derived from benzene. In the second memoir, Mr. Wilkinson describes a further series derived from para-chlor-iodo-benzene, C_6H_4ClI. The formation of both series occurs precisely as in the case of the benzene derivatives. The base derived from toluene was prepared from the para iodide of toluene as starting point. Its composition is $(C_6H_4 . CH_3)_2I . OH$, iodine apparently acting, as in the bases previously described, in a trivalent capacity, and forming the central element around which the two toluene radicles and the hydroxyl are grouped. The base itself has only been obtained in aqueous solution, but many of the salts crystallise well, and are consequently readily isolated. The iodide, $(C_6H_4 . CH_3)_2I . I$, is precipitated as a white powder, extremely sensitive to light, and melting at 146°. The corresponding chloride and bromide both crystallise from water in needles which melt at almost the same temperature in the neighbourhood of 178°. The bichromate is a particularly beautiful salt, crystallising from hot water in large orange-red plates. It is likewise explosive, detonating when heated. The nitrate, $(C_6H_4 . CH_3)_2I . NO_3$, is very soluble in water, and melts at 139°. The per-iodide is a remarkable compound, $(C_6H_4CH_3)_2I . I_3$, obtained by addition of two further atoms of iodine to the ordinary iodide above mentioned. It crystallises in dark red needles, endowed with a very brilliant lustre, and melting at 156°. In addition to these salts, double salts with the chlorides of gold, platinum and mercury are described, all of which crystallise well and exhibit definite melting points. The base of the series described by Mr. Wilkinson possesses the composition $(C_6H_4Cl)_2I . OH$, being derived from para chlor-iodo-benzene by reactions analogous to those by means of which the base above described was obtained, and similar to those previously described by Prof. Meyer. The iodide, chloride, bromide, nitrate and chromate, as well as double salts with the chlorides of mercury and platinum, have been obtained in well-defined crystals. Hence it would appear that the reactions discovered by Prof. Meyer and Herr Hartmann, between iodosobenzene and silver oxide, and between sulphuric acid and iodosobenzene, which resulted in the preparation of the first iodonium bases, are of pretty general application in the benzene series. These remarkable compounds containing iodine as the grouping element must now, therefore, be regarded as thoroughly well established, and the older idea as to the nature of the iodine atom must give place to a fuller conception of the capabilities of that element.

THE additions to the Zoological Society's Gardens during the past week include a Chacma Baboon (*Cynocephalus porcarius*) from South Africa, presented by Captain Webster; a White-throated Capuchin (*Cebus hypoleucus*) from Central America, presented by Mr. H. W. Manning; a Senegal Parrot (*Pœocephalus senegalus*) from West Africa, presented by Miss Alice Firman.

OUR ASTRONOMICAL COLUMN.

NEW STARS AND NEBULÆ.—The first number of the *Astrophysical Journal* has come to hand. It is practically a continuation of *Astronomy and Astro Physics* in a slightly different form, and is now published by the Chicago University Press. Among the contributions to the journal is a paper, by Prof. W. W. Campbell, on some interesting and significant changes which have occurred recently in the spectrum of Nova Aurigæ. The intensities of the two lines at λ 4360 and λ 5750 appear to have decreased very materially. When Prof. Campbell observed the Nova spectrum in 1892, these two lines were stronger in the Nova than in the nebulæ in the spectra of which they were seen and photographed. Observing last November, however, he found that this condition of things was reversed, the lines appearing relatively fainter in the Nova than in the nebulæ. As is now very well known, the spectra of nebulæ differ both as regards the number and intensity of the lines. The recent observations of the Nova seem to show that the spectrum is not only nebular, but it is approaching the average type of nebular spectrum. Prof. Campbell thus sums up the bearing of spectroscopic observations upon theories proposed to account for the genesis of new stars:—

"The Harvard College Observatory has shown that both Nova Aurigæ and Nova Normæ at discovery possessed substantially identical spectra of bright and dark lines, similarly and equally displaced. Both diminished in brightness and both assumed the nebular type of spectrum. The new star of 1876 in Cygnus probably had nearly an identical history: passing from a bright star with a spectrum of bright and dark lines, to a faint object with a spectrum consisting of one bright line (undoubtedly the nebular line λ 5010, or the two nebular lines λ 5010 and λ 4960 combined). We may say that only five 'new stars' have been discovered since the application of the spectroscope to astronomical investigations, and that three of these have had substantially identical spectroscopic histories. This is a remarkable fact. We cannot say what the full significance of this fact is. One result, however, is very clear: the *special* theories propounded by various spectroscopists to account for the phenomena observed in Nova Aurigæ must unquestionably give way to the more *general* theories."

THE DESIGNATION OF COMETS.—A uniform system of cometary notation is certainly needed. The *Observatory* points out that though the small letters *a*, *b*, *c*, &c., are now generally used to denote the order of discovery, and Roman numerals I., II., III., &c., to indicate the order of perihelion passage, astronomers are not agreed whether to write Comet *a* 1894, Brooks's Comet, or Comet Brooks. It is therefore suggested, and the suggestion deserves to be acted upon, that in the future the order shall be letter, year, Roman numeral, discoverer. The full name of the comet would then run as follows:—Comet *a* 1892, I. (Swift): and if any part of the name be quoted, this order should be preserved. Those who have had to search for observation of comets in astronomical publications, will welcome the system of uniformity in indexing, proposed by our contemporary.

THE NEW CONSTITUENT OF THE ATMOSPHERE.[1]

I. *Density of Nitrogen from Various Sources.*

In a former paper[2] it has been show that nitrogen extracted from chemical compounds is about ½ per cent. lighter than "atmospheric nitrogen."

The mean numbers for the weights of gas contained in the globe used were as follows:—

From nitric oxide	2·3001
From nitrous oxide	2 2990
From ammonium nitrite	2·2987

while for "atmospheric nitrogen" there was found—

By hot copper, 1892	2·3103
By hot iron, 1893	2·3100
By ferrous hydrate, 1894	2 3102

At the suggestion of Prof. Thorpe experiments were subsequently tried with nitrogen liberated from *urea* by the action of sodium hypobromite. The hypobromite was prepared from commercial materials in the proportions recommended for the analysis of urea. The reaction was well under control, and the gas could be liberated as slowly as desired.

In the first experiment the gas was submitted to no other treatment than slow passage through potash and phosphoric anhydride, but it soon became apparent that the nitrogen was contaminated. The "inert and inodorous" gas attacked vigorously the mercury of the Töpler pump, and was described as smelling like a dead rat. As to the weight, it proved to be in excess even of the weight of atmospheric nitrogen.

The corrosion of the mercury and the evil smell were in great

[1] Abstract of a paper by Lord Rayleigh, Sec. R.S., and Prof. William Ramsay, F.R.S., read before the Royal Society, at a special meeting, on January 31.

[2] Rayleigh, "On an Anomaly encountered in Determinations of the Density of Nitrogen Gas," *Roy. Soc. Proc.* vol. lv. p. 340, 1894.