THE additions to the Zoological Society's Gardens during the past week include a Golden Eagle (*Aquila chrysaetus*) from Norway, presented by Lord William Beresford, V.C.; a Raven (*Corvus corax*), British, presented by Mr. J. Collingham; two Tree Frogs (*Hyla arborea*), European, presented by Master Kneeshaw; a Grey Parrot (*Psittacus erithacus*) from West Africa, deposited.

OUR ASTRONOMICAL COLUMN.

COMET PERRINE (DEC. 8).—In *Astronomischen Nachrichten* (No. 3391) are given the elements and an ephemeris of the comet which was discovered by Mr. Perrine on December 8 last. This shows that the comet is decreasing in declination and increasing in right ascension, its position for December 30 being given as R.A. (apparent) 3h. 9·7m., Decl. (apparent) − 0° 9′. Its brightness is now about half what it was on December 10. The elements, communicated also by Dr. F. Ristenpart, are very nearly similar to those referred to above. These are given in a later number of the *Astronomischen Nachrichten* (No. 3393), together with an ephemeris, calculated by Dr. Ristenpart, up to the middle of January, from which we make the following extract:—

12*h*. *Berlin M.T.*

1897.	R.A. 1897·0 h. m. s.	Decl. 1897·0 ° ′	log *r*.	log Δ.	Br.
Jan. 1 ...	3 28 11	... − 0 49·1			
2 ...	33 28	... 0 56·7			
3 ...	38 38	... 1 3·5	... 0·1030	9·6149	0·46
4 ...	43 41	... 1 9·5			
5 ...	48 36	... 1 14·7			
6 ...	53 24	... 1 19·2			
7 ...	58 5	... 1 22·9	... 0·1123	9·6482	0·38
8 ...	4 2 38	... 1 26·0			
9 ...	7 5	... 1 28·4			
10 ...	11 25	... 1 30·2			
11 ...	15 39	... 1 31·4	... 0·1222	9·6823	0·31
12 ...	19 48	... 1 32·0			
13 ...	23 52	... 1 32·1			
14 ...	4 27 46	... − 1 31·6			

A matter of some interest is the similarity of the elements which have been obtained by Messrs. Hussey and Perrine, and those of Biela's comet. The following shows the two systems of elements:—

	Perrine.	*Biela* 1832 *III.*
T =	1896, Nov. 25·67 M.T.G.	1832, Nov. 26·4 M.T.G.
ω =	164° 36′	109° 56′
Ω =	243 49	248 12
i =	16 29	13 12
q =	1·1540	0·8793

"HIMMEL UND ERDE."—The astronomical contributions to the December number of this monthly include, besides a somewhat lengthy obituary notice of M. Tisserand (with a portrait), the last of a series of articles by Dr. G. Witt on the planet Saturn, several illustrations accompanying the text; such recent work as that accomplished by Keeler regarding the constitution of the ring as deduced from the movement of the lines in the spectrum, and Campbell's spectroscopic work are both referred to at some length. Of the shorter articles, an interesting account is given of Prof. Newcomb's important work on the transits of Mercury across the sun's disc. By using newly-constructed sun- and Mercury-tables, Prof. Newcomb still found that differences between calculated and observed values were obtained. How to account for these was his next object of research. Might not such differences be due to a false assumption in assuming that the earth rotates at a constant speed around its axis? Or are they the results of inequalities in the moon's motion? Prof. Newcomb finally concluded that in the mean motion of the moon there must be one, if not more inequalities of long period which our present theory has not yet analytically proved.

ASTRONOMICAL SOCIETY OF FRANCE.—The *Bulletin* of this Society for the month of December contains, among other matters, an interesting address by M. Janssen on the late Director of the Paris Observatory, M. Tisserand. M. Gilbert concludes in this number his article on the mechanical proofs of the rotation of the earth, dealing here chiefly with the experiments made with various kinds of gyroscopes. Among the notes will be found a description, by M. Camille Flammarion, of a pulpit sculptured in wood, having the form of an inclined terrestrial globe with the continental outlines worked on it. The south pole is situated underneath, and bears the inscription, "Regiones australes incognitæ." It was constructed in the year 1600, and is cut out of a single piece of oak. M. Flammarion discovered this pulpit in the Chapel of Saint-Sang at Bruges, a small church built in the year 1150, and restored in the sixteenth century and since.

THE DAVY-FARADAY RESEARCH LABORATORY.

THE Davy-Faraday Research Laboratory, established and equipped by Dr. Ludwig Mond, was opened by the Prince of Wales on Tuesday, December 22. We have already expressed our appreciation of this generous gift to British science, and have described the accommodation and equipment of the new laboratories (vol. liv. p. 200). With a munificence which we hope will find many imitators, and a just regard of the value of scientific research, Dr. Mond has established a place where investigations can be carried on without interruption, and with the best appliances. He has not only furnished the laboratory with the most modern instruments and appliances for researches in pure and physical chemistry, but has also given an ample endowment, so that the laboratory may be maintained in a state of thorough efficiency, his object being to give every assistance and encouragement, within the limits of the endowments, to scientific workers. To accomplish this has cost a hundred thousand pounds, of which sum 38,000*l*. is sunk in the building and its equipment, while the remaining 62,000*l*. constitutes the endowment fund. For the very practical way in which Dr. Mond has shown his interest in the promotion of material knowledge, men of science cannot express too warm a sense of gratitude. We look to the workers in the laboratory to repay the generosity of the founder by their contributions to knowledge, and so induce other benefactors to follow the example set by Dr. Mond.

The following account of the opening of the laboratory, abridged from the report in the *Times*, will be read with interest:—

Dr. Mond, addressing the Prince of Wales, said that under the auspices of his Royal Highness's august father, whose enlightened mind had fully realised that the pursuit of pure science was the most potent factor in the promotion of the intellectual as well as the material progress of this or any other nation or of humanity at large, a movement was set on foot fifty years ago to found an institute for the pursuit of pure chemistry, which was not only to give practical and systematic instruction to students, but was also to provide a place where original research could be conducted by fully-qualified investigators. At first it was proposed to attach this institute to the Royal Institution. The eminent professors of the time, Faraday and Brande, expressed their strong approval of the intended project, and their desire that it might be carried out at the Royal Institution, if it could be done well; but, nevertheless, this idea had to be abandoned, because sufficient accommodation could not be found within the precincts of the institution. The first part of the scheme was carried out a few years later by the foundation of the Royal College of Chemistry, which, under the guidance of the illustrious Hofmann, soon became one of the most successful schools of chemistry in the world; but the second part, that of providing a place where original researches could be carried on by a number of independent investigators, had been waiting all this time for its realisation. Several years before these facts came to his knowledge he had determined of his own accord to found in London a laboratory of research in purely scientific chemistry and in physical chemistry, that borderland between chemistry and physics from which, in his opinion, they might hope to learn more about the real nature of things than from any other branch of natural science. He also had come to the conclusion that such a laboratory would derive the greatest advantage if it could be associated with the Royal Institution of Great Britain, which had during its long existence made the promotion of original research in these sciences one of its main objects, and the laboratories of which had been productive and

were still productive of such marvellous results at the hands of the eminent professors elected by the institution. He therefore gladly embraced the opportunity which recently presented itself of acquiring the commodious house immediately adjoining the Royal Institution, and submitted a scheme to its managers, which met with their fullest sympathy and which they readily accepted with unanimity. Work was immediately commenced to alter the building so as to make it suitable for its new purpose, and, thanks to the advice which had been freely extended to him by scientific men all over the world, and the active co-operation of Lord Rayleigh and Prof. Dewar, of the architect, Mr. Flockhart, and of his son, Mr. Robert Mond, to whom he left the selection of the apparatus and the equipment of the place generally, the laboratory which they asked his Royal Highness to inaugurate that day would stand favourable comparison with any other laboratory in or out of England as to the completeness and convenience of its appliances, and was provided with the best instruments made at the present day. It was unique of its kind, being the only public laboratory in the world solely devoted to research in pure science. In order to insure its continued usefulness he had endowed it so as to cover the cost of maintenance of the fabric and all necessary current expenses. He named it the Davy-Faraday Research Laboratory in perpetual memory of those two great pioneers of science who carried out their world-famed and epoch-making researches almost on that spot, and whose example he hoped would stimulate and inspire every one who came to work under that roof. It was a source of very great gratification to him that the eminent successors of those great men, Lord Rayleigh and Prof. Dewar, had consented to undertake the duties of directors of the laboratory, and this gratification had been the greater because those gentlemen made it a condition of their acceptance of the post that it should be without emolument. An experienced superintendent had been appointed in the person of Dr. Scott, and nothing was now wanting for its success but a number of investigators competent and ardent to continue the great work of this century, the unravelling of the secrets of nature. As soon as his Royal Highness had declared the building open, persons of either sex or any nationality would be welcome within its walls who could satisfy the laboratory committee that they were fully qualified to undertake original scientific research in pure and physical chemistry, and preference would naturally be given to those who had already published original work. If this country had distinguished itself in one way more than another in that glorious rivalry with other nations for extending our knowledge of natural phenomena and our power over the forces of nature it had been by the large number of contributors to our knowledge, who on the continent would be called amateurs in science—men who devoted their lives to the study and advancement of science from pure love for the subject. He need only instance the names of Cavendish, Joule, and Darwin to say that they included men of the very highest rank. In giving this laboratory to the English nation he had done so in the firm conviction that this country would continue to bring forth in the future, as it had done in the past, men of the same rank and of the same devotion to science for its own sake, and it was a fond hope of his that such men would find there all the facilities and all the necessary appliances for carrying out their researches. The further we advanced in the study of nature the more accurate and elaborate was the apparatus required, and the more difficult it became to carry on delicate work in a private laboratory. He had placed that laboratory in the centre of London because he believed that this great city would continue to be the intellectual centre of the civilised world, where the brightest minds would congregate. He had intrusted it to the Royal Institution so as to insure its being open to men and women of all schools and of all views on scientific questions. It had given him great pleasure that in establishing the Davy-Faraday Laboratory, he had been able at the same time to enlarge the old laboratories of the Royal Institution, and also to make additions to its library and reception rooms, which he hoped would prove a convenience to its members. He looked upon that laboratory as an important step forward in that great movement for the advancement of scientific research in this country, to which his Royal Highness's revered and illustrious father gave so powerful an impulse, and which has been so distinguished a feature of the many-sided and unparalleled progress made by this nation during the glorious reign of his mother, her Majesty the Queen. It was a source of specially great satisfaction to him that his Royal Highness deemed that laboratory worthy to be opened by himself, and he humbly thanked his Royal Highness for having come there that day. His presence on that occasion would certainly add very greatly to the success of the Davy-Faraday Research Laboratory of the Royal Institution.

The Prince of Wales in reply said:—Prof. Mond, it affords me much satisfaction to assist at the opening of the series of beautifully-arranged and well-equipped research laboratories which this country owes to your generosity, and I congratulate the members of the Royal Institution of Great Britain upon this most important accession to the resources which have been placed at the command of the institution for the advancement of chemical and physical science. The Royal Institution has long enjoyed a world-wide reputation, thanks to the marvellous work of the succession of illustrious men whose researches, carried on within these walls, have very largely contributed to secure and maintain for this country a foremost position as a source of great discoveries and important advances in science and its applications. The identification of the laboratories which you have founded with the names of two of the most eminent of former professors of the Royal Institution and of English men of science—Humphry Davy and Michael Faraday—is a graceful act on your part. The fact that the present distinguished professors of physics and chemistry, Lord Rayleigh and Prof. Dewar, have undertaken the important duties of directors of the new research laboratories without any remuneration must afford most gratifying evidence to you of the great faith entertained by them in the benefit to the promotion of science which your wisely-applied munificence is destined to realise.

THE BACTERIA WHICH WE BREATHE, EAT, AND DRINK.[1]

THE surface of the earth is inhabited by bacteria: wherever there is dead organic matter, wherever there are human or animal excreta, wherever decomposition is going on, in stagnating or in flowing water, within our houses and without, bacteria collect. They are so widely distributed that practically everywhere we are surrounded by these minute vegetable cells. From the bacteriological standpoint we live amongst decomposing matter. Without bacteria there is no decomposition or putrefaction; they reduce the organic matter to "dust," and with the atomised matter they are again carried away by air or water. Dust is laden with bacteria, and since a great part of dust is derived from decomposing matter, it follows that, although we do not realise it, we are living in an atmosphere of decomposition.

The air which we breathe, therefore, contains bacteria. These vary in amount with certain conditions. If the air is calm their number diminishes, but if there is wind or draught, they may be present in enormous numbers. Again, in the open country air there are, other things being equal, considerably less micro-organisms than in the dusty streets of London. Thus there is an extraordinary difference between the air in Oxford Street and on Wandsworth Common.

The air may be roughly tested by coating sterile plates of glass with gelatine, and exposing them for a given time in the locality which we wish to examine. The bacteria will fall on the surface of the gelatine, and on incubation at a suitable temperature they will develop into visible colonies which can be readily counted. The number of colonies is a fair, though not an absolute, index of the bacterial purity or impurity of the air. The more colonies we find on the surface of the gelatine, the more bacteria, of course, the air must have contained. A plate exposed in Oxford Street would be covered with colonies, while a plate exposed on Wandsworth Common would show only a few. This is, of course, only a rough-and-ready method which cannot be used for accurate work, but, nevertheless, it gives us good comparative results.

The lantern slides exhibited on the screen demonstrate to you that the air which we breathe always contains micro-organisms, and that therefore we are always inhaling bacteria. Many organisms are incapable of growing at the temperature of the body; they require a lower temperature. Such organisms, we may assume, cannot thrive in the body of the warm-blooded animal,

[1] A lecture delivered at the London Institution, by Dr. A. A. Kanthack, Lecturer on Pathology, St. Bartholomew's Hospital.