rank engaged in the extension of natural knowledge. The present volume contains reports upon scientific work, as, for example, those by Dr. Langley upon observations of the solar eclipse of May 28, 1900, the new spectrum, and the Langley aerodrome; scientific articles from magazines, as Sir Norman Lockyer's account of the progress of astronomy during the nineteenth century, Prince Kropotkin's article on unsuspected radiations, and the late Dr. J. Fiske's reminiscences of Huxley ; presidential addresses, as Prof. W. J. Sollas's address on evolutional geology, delivered before the British Association in 1900, and Dr. G. M. Sternberg's address on malaria; several papers read before scientific societies, as one by Prof. V. B. Lewes on incandescent mantles, and Mr. E. S. Grogan's paper, read before the Royal Geographical Society, on his journey through Africa from the Cape to Cairo; original articles on Chinese folklore, and the restoration of extinct animals, and several translations, among which we notice a paper by Dr. Janssen on the progress of aëronautics, and one by Dr. F. Delitzsch on discoveries in Mesopotamia. In addition to these articles there are a number of others dealing with the progress of various branches of science during the nineteenth century. We are grateful to Dr. Langley for collecting these contributions to scientific literature from many sources and rendering them easy of access in his annual anthology.

THE additions to the Zoological Society's Gardens during the past week include a Bonnet Monkey (*Macacus sinicus*) from India, presented by Mr. L. E. Carmalt; a Macaque Monkey (*Macacus cynomolgus*) from India, presented by Mr. W. H. Sheridan; a Black-eared Marmoset (*Hapale penicillata*) from South-east Brazil, presented by Mrs. Augusta Ryland; a Common Squirrel (*Sciurus vulgaris*), British, presented by Mr. R. B. Hatfield; a Red-faced Spider Monkey (*Ateles paniscus*) from Guiana, a Barnard's Parrakeet (*Platycercus barnardi*) from South Australia, five Conical Eryx (*Eryx conicus*), a Longsnouted Snake (*Dryophis mycterizans*), a Hamilton's Terrapin (*Damonia hamiltoni*) from India, two Black-headed Terrapins (*Damonia reevesi unicolor*) from China, deposited; two Coscoroba Swans (*Coscoroba candida*) from Antarctic America, purchased.

## OUR ASTRONOMICAL COLUMN.

THE ANNULAR ECLIPSE OF THE SUN, NOVEMBER II, 1901.—The successful observation of this eclipse by M. A. de la Baume Pluvinel at Cairo was announced by telegram some time ago, and his complete report of the operations appears in the *Comptes rendus* (vol. cxxxiii. pp. 1180–1185). Although the results were in general successful, the conditions were somewhat unfavourable owing to the low altitude, about 15°, of the sun at mid-eclipse.

Three lines of investigation were attempted.

(1) The examination of the solar spectrum at grazing incidence on the moon's surface. This was done with a powerful grating spectrograph, using an image of the sun about 14 mm. diameter on the slit plate. No variation in the various groups of lines examined could be detected, and it was concluded that this rendered the existence  $\gamma f$  any lunar atmosphere extremely improbable.

(2) Photographs of the crescents presented at second and third contacts were obtained in the hope of detecting any difference in constitution between the chromosphere and the outer photospheric layers. These were taken with a small prism spectrograph, having condenser, collimator, and camera objectives all about 0.60 metre focal length. A considerable number of arcs were obtained, and a list is given showing their wavelengths in comparison with Young's chromospheric layer about 20" of arc in height, but beside these there appeared a series of more feeble images corresponding to a layer some  $40^{\circ}$  high. The

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absence of the hydrogen series so conspicuous in the chromospheric spectrum is attributed to the mutual action of chromospheric radiation and photospheric absorption.

(3) Attempts to photograph the corona in presence of sunlight. This had appeared feasible in consequence of the impressions obtained several seconds after totality during the eclipse of January 1898, in India. For this work he employed a Cooke triple photo-visual objective of 1.5 ometres focal length. This instrument and the image lenses of the two spectrographs were fed by 3 plane mirrors mounted on a single celostat.

were fed by 3 plane mirrors mounted on a single cœlostat. As the diameters of sun and moon differed by 1' 24" there were about 16/100ths of the sun's disc still visible at mid-eclipse. Two photographs, with 3 seconds and 10 seconds exposure, were obtained, but the aureole shown is not thought to be truly coronal.

Attempts were also made to detect the corona by utilising the action of the calorific rays on phosphorescent substances, but with negative results.

## THE MAMMALS OF NORTH AMERICA.

A MONGST the recently issued publications of the Field-Columbian Museum of Chicago we find a list of the land and sea mammals of North America, north of Mexico, prepared by Mr. D. G. Elliot, curator of the department of mammals in that institution. The list is stated to contain the names of all the forms of North American mammals found on land or in the adjacent seas which had been described up to the date of publication (June 10, 1901), at any rate all those that "under the most lenient treatment are entitled to any sort of consideration." This most useful catalogue serves to show us very plainly the great activity of the American zoologists in this particular department of their science during recent years. In the late Prof. Baird's work on North American mammals, published in 1857, only 220 terrestrial species of years. this class (not including the bats) were recognised as occurring in the northern portion of the American continent, besides thirty-six others which were considered as of doubtful authen-Mr. Elliot's list contains the names of 628 species ticity. besides 368 subspecies, so that, if we take it as correct, the number of recognisable forms of North American mammals has been enormously increased of late years. It will be interesting to ascertain in what groups of the class of mammals this great augmentation has mainly taken place. This is shown in the following tabular statement :---

			Elliot, 1901			Baird, 1857
			Sp.	Subsp.	Total	Sp.
Order	i. ii	Marsupialia Edentata	2	I	3	2
,, ,,	iii.	Sirenia	2	_	2	
,,	v.	Ungulata	40 25	2 11	48 36	15
»» »»	vi. vii.	Rođentia Carnivora	380 88	255 62	635 150	130 46
,,	viii. ix.	Pinnipedia Insectivora	14 47	22	14 60	- 26
9 9. 	х.	Chiroptera	23	15	38	
			628	368	996	220

In considering these figures it must be remarked that as Baird did not include the three groups of marine mammals or the Chiroptera in the scope of his work no complete comparison can be made. But it will be obvious, on a glance at the comparative tables, that it is the smaller mammals, the Rodents and Insectivores, that have so greatly increased in multitude, according to the present fashion of dealing with them. The Rodents, of which Baird only recognised 130 in North America, are now supposed to number 380 species, besides 255 subspecies, and the Insectivores have risen from 26 species to 47 species and 22 subspecies. It is, of course, only natural that a considerable increase of species should have taken place in both these groups, as numerous and active collectors sent out by the United States National Museum and by the Agricultural Department at Washington have of late years traversed every part of the large western States and the adjoining districts of Mexico, where the members of these two groups are found in abundance. The collections thus made have been worked out by Dr. C. Hart Merriam, Mr. Allen and other well-known American naturalists, who have specially devoted their energies to the study of these groups of mammals. It may be fairly stated that in the opinion of many naturalists (who perhaps in these days would be pronounced to be somewhat old-fashioned) the process of the subdivision of species (vulgularly called "splitting") has, in some cases, been carried too far, especially as regards subspecies. At the same time there is no doubt about the high character of the work executed so diligently by Dr. Merriam and his *confrères*. We may point out, however, that the same kind of subdivision has been carried on also, to a certain extent, amongst the larger mammals. On turning over the pages of Mr. Elliot's "List" it will be noticed that the reindeer (Rangifer) of North America, which the old-fashioned naturalists have hitherto classed as being specifically inseparable from the European form (R. tarandus), is now held to consist of seven different species, and that the Rocky Mountain sheep, of which, until lately, only a single species was generally recognised, has been split into four or five species. Referring to the Carnivora, we find the southern lynx (Felis rufa) divided into nine subspecies, and the Virginian for (*Canis virginianus*) into seven subspecies. The bears of North America, according to Mr. Elliot's "List," now consist of nine species, besides three subspecies. We in Europe have been accustomed to refer them all to three species only. In a similar way the skunks of North America (*Mephitis*) of which Baird only recognised five species, are now held to number no less than twenty species and four subspecies, divided into three genera.

What we have stated (to which more remarks of a similar character might easily be added) will serve to show that a great revolution is now taking place in the mode of treating the mammals by American workers. Symptoms of the same class of work have also occurred in Europe, but the process has not been carried on here to so great an extent, nor has it met with such general acceptance. Whatever may be its results it will certainly be necessary to add greatly to the space now occupied by the mammals in museums of natural history, for it is only a very large series of specimens that will enable the conscientious student to decide between the opposing claims of the "splitters" and the "lumpers," and to decide what are species and what are subspecies.

## PRIZE SUBJECTS OF THE PARIS ACADEMY OF SCIENCES.

THE Comptes rendus of the Paris Academy of Sciences for December 16, 1901, contains a list of the prizes proposed for the years 1902, 1903, 1904, 1905 and 1906. The subjects proposed for the current year include the following :--

Geometry.—The subject proposed for the grand prize of the mathematical sciences is to perfect, in an important point, the application of the theory of continued groups to the study of partial differential equations; for the Bordin prize (3000 fr.), to develop and perfect the theory of surfaces applicable to the paraboloid of revolution; the Franceur prize (1000 fr.) and the Poncelet prize (2000 fr.) will be awarded for works useful to the progress of pure or applied mathematics.

Mechanics.—The Plumey prize (2500 fr.) for an improvement in the steam engine or any other invention contributing to the progress of steam navigation; a Montyon prize (700 fr.) for invention or improvement of instruments; extraordinary prize of 6000 fr. for any invention tending to improve the efficacy of the French naval forces.

Astronomy.—The subject announced for the Damoiseau prize (1500 fr.) is the completion of the theory of Saturn as given by Le Verrier, publishing the rectifying formulæ and establishing the agreement between theory and observation; the Janssen

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gold medal for an important discovery in physical astronomy; and the Lalande (540 fr.) and Valz (460 fr.) for general work in astronomy.

Geography and Navigation.—The Binoux prize (3000 fr.) will be awarded for the best work on this subject.

*Physics.*—The Hébert prize (1000 fr.) for a practical application of electricity.

 $\mathit{Statistics}, -\!\!\!\!-\!\!\!\!\!\!A$  Montyon prize (500 fr.) for a memoir on the statistics of France.

Chemistry.—The Jecker prize (10,000 fr.) for work tending to the progress of organic chemistry.

Mineralogy and Geology.—The Fontannes prize (2000 fr.), to the author of the best palæontological publication.

*Physical Geography.*—The Gay prize (2500 fr.) for a memoir on the progress realised in the nineteenth century in the study and representation of the earth.

*Botany.*—The Desmazières prize (1600 fr.) will be awarded, independently of nationality, to the author of the best work on cryptogams; the Montagne prize (500 fr.) for a memoir on the anatomy, physiology or development of the lower cryptogams.

Anatomy and Zoology.—The Savigny prize (1500 fr.) for the assistance of young travelling zoologists, not receiving Government assistance, who occupy themselves especially with the invertebrates of Egypt and Syria; the Vaillant prize (4000 fr.) for the study of the fauna of an Antarctic island of the Indian Ocean; the Thore prize (200 fr.) for the best work on the habits and anatomy of a species of European insect.

Medicine and Surgery.—A Montyon prize for works useful in the art of healing; the Barbier prize (2000 fr.) for a valuable discovery in surgical, medical or pharmaceutical science; the Breant prize (100,000 fr.) for the discovery of a radical cure for Asiatic cholera, or for indicating in an indisputable manner the causes of Asiatic cholera in such a manner as to lead to its suppression, or, failing this, the interest on the capital sum will be awarded for a rigorous proof of the existence in the atmosphere of matter capable of taking part in the production or propagation of epidemic diseases, or for the discovery of a radical cure for herpes or for clearing up its etiology; the Godard prize (1000 fr.) for the best memoir on the anatomy, physiology or pathology of the genito-urinary organs; the Series prize (7500 fr.) for the best work on general embryology, applied, as far as possible, to physiology and medicine; the Bellion prize (1400 fr.); the Mège prize for an essay on the causes which have retarded or favoured the progress of medicine from the oldest times to the present day; the Lallemand prize (1800 fr.) for work on the nervous system; and the Baron Larrey prize (1000 fr.) for the best work presented to the Academy treating of military medicine, surgery or hygiene.

*Physiology.*—A Montyon prize (750 fr.); the Pourat prize (1400 fr.) for a memoir on the comparative study of the mechanism of respiration in mammals; the Martin-Damourette prize (1400 fr.) and the Philipeaux prize (880 fr.) for work in experimental physiology.

General prizes.—The Arago medal is awarded by the Academy in recognition of a work or discovery of the first rank; the Lavoisier medal is awarded without distinction of nationality to chemists who have rendered eminent service to their science; a Montyon prize (unhealthy trades) for discoveries or inventions diminishing the dangers of any unhealthy trade; the Wilde prize (4000 fr.), awarded without distinction of nationality, for that work or discovery which, in the opinion of the Academy, is best worthy of recompense in astronomy, physics, chemistry, mineralogy, geology or experimental mechanics; the Tchihatchef prize (3000 fr.) for exploration in the lesser-known parts of Asia; the Delalande-Guérineau prize (1000 fr.) for services rendered to French science; the Jérome Ponti prize (3500 fr.); the Houllevigue prize; the Cahours prize (3000 fr.) for the encouragement of young men already known for their work, especially in chemistry; the Saintour prize (3000 fr.); the Trémont prize (1100 fr.); the Gegner prize (3800 fr.); the prizes founded by Mme. la Marquise de Laplace and by M. Félix Rivot.

Of these prizes some are explicitly and others tacitly restricted to Frenchmen; among those expressly stated to be offered without restriction of nationality are those bearing the names of Leconte, Tchihatchef, Wilde, Lavoisier, Arago, Desmazières, Delesse, La Caze, Lalande and Pierre Guzman.