MESSRS. GURNEY AND JACKSON have in the press "A Handbook of European Birds," by James Backhouse, Jun. The author explains that, having frequently experienced the need of a handy reference volume on European birds, he has been at great pains to meet this want, by endeavouring to produce a complete series of short general descriptions, in a convenient form either for the portmanteau or the pocket. The work will be published by subscription during the autumn or early spring.

THE last published number (31) of *Excursions et Reconnaissances*, the official scientific and learned journal of the French possessions in Indo-China, contains the first of a series of articles, by M. Aymonier, the well-known scholar, on the writing, dialects, history, manners, and customs of the Chams, the ancient masters of Annam proper. The present instalment deals with the grammar, and is illustrated by some lithographs of their writing and their curious cursive alphabets. These are followed by a portion of a Romanized version, with a translation, in French prose, of an Annamite rhymed tragedy.

IN our abstract of the chemical papers at the British Association (p. 587) we gave an account of the paper on alloys read by Messrs. Heycock and Neville. These gentlemen send us the following expansion of our statement:—"(1) Our experiments lead us to the conclusion that the *molecule of aluminium when in solution in tin is* $Al_2 = 54$, and not, as stated, that its atomic weight is different from the accepted value. (2) We stated that the mere application of Raoult's method to alloys does not decide the molecular weight of metals in solution, because we have no standard molecule, of which the molecular complexity in solution is certainly known, to take as unity. By applying Van 't Hoff's theory of solution to alloys of tin, we calculate a number for the fall in the freezing-point produced by one *molecule* of metal in 100 molecules of tin which is almost identical with the constant fall found in our experiments for *one atom* of metal in 100 of tin. Hence we conclude that, with the exception of aluminium, and possibly indium, all the seventeen metals we have examined have single atom molecules when in solution in tin. Our experiments, therefore, in the main, confirm Prof. Ramsay's results obtained by another method, and E. Tamman's results with amalgam."

METHYL HYDRAZINE, $CH_3-NH-NH_2$, the simplest derivative of hydrazine or amidogen, $\begin{matrix} NH_2 \\ | \\ NH_2 \end{matrix}$, has been isolated by Dr. Gustav von Brüning in the Chemical Laboratory of the University of Wurzburg (*Liebig's Annalen*). It is a clear and very mobile liquid, boiling at 87° C., and possessing a most violent affinity for water, resembling in this respect the recently-isolated hydrazine itself. Its odour is very similar to that of methylamine, and the vapour produces a white cloud in the air due to absorption of moisture to form minute drops of the liquid hydrate. Brought in contact with water, it instantly dissolves with evolution of great heat. It reduces Fehling's solution in the cold, and decomposes nitrous acid with copious evolution of free nitrogen. Its hygroscopic character is so pronounced that it attacks the skin in a most painful manner, and rapidly destroys corks or caoutchouc stoppers. The mode of preparation finally adopted by Dr. von Brüning is in reality very simple, the only difficult operations being those involving its separation from water. It consists in first converting the mono-methyl derivative of urea, $CH_3-NH-CO-NH_2$, into the nitroso-compound, $CH_3-N(NO)-CO-NH_2$; this, upon reduction with zinc dust and glacial acetic acid, yields the corresponding hydrazine urea, which in turn is broken up by boiling with hydrochloric acid into carbonic anhydride, ammonia, and methyl hydrazine. In practice, 50 grams of nitrate of methyl urea are dissolved in warm water, and the solution cooled until crystals begin to form. Crushed ice is then added to keep the temperature as low as possible during the addition of the calculated quantity of solid sodium nitrite; the moment the nitrite is added, the nitroso-compound commences to separate in small yellow lamellæ, and may be obtained recrystallized from ether in much larger slightly yellow tables. The reduction of this nitroso body is then effected by suspending it in water and adding glacial acetic acid and zinc dust, the latter in small portions at a time, with constant agitation. The cold solution, filtered from excess of zinc dust, is then saturated with hydrochloric acid, and afterwards evaporated to a syrupy consistency. The syrup is next boiled for some hours with a concentrated solution of hydrochloric acid in a flask connected with an inverted condenser, after which the liquid is neutralized with a strong soda solution at a low temperature, and sufficient excess of soda added to redissolve the precipitated zinc hydrate. The alkaline solution is then distilled in steam, when the base rapidly and completely passes over, ammonia and methylamine escaping as gases. After removal of most of the dissolved ammonia and methylamine by boiling in the flask supplied with inverted condenser, the base is converted to its acid sulphate, $CH_3-NH-NH_2 . H_2SO_4$, and the crystals of this salt are distilled with a concentrated solution of soda containing pieces of solid sodium hydrate. The last trace of ammonia escapes, while the methyl hydrazine condenses in the cooled receiver. After allowing the distillate to remain in contact with solid soda for twenty-four hours, and then re-subjecting it to distillation, it is still found to contain water. It was, however, finally freed from water by heating to 100° C. in a sealed tube with anhydrous barium oxide.

THE additions to the Zoological Society's Gardens during the past week include a Pigtailed Monkey (*Macacus nemestrinus* ♂) from Java, presented by Mrs. Cosh; three Common Hedgehogs (*Erinaceus europæus*), British, presented by Mr. H. Pelham Curtis; two Cayenne Aracaris (*Pteroglossus aracari*) from Macey, Brazil, presented by Mr. Thomas Watson Permain; a Red and Blue Macaw (*Ara macao*) from Central America, presented by Mr. Robert Romer, Q.C.; a —— Hawk (*Asturina* sp. inc.) from Brazil, presented by Mr. J. E. Wolfe; a Well-marked Tortoise (*Homopus signatus*), a Rufescent Snake (*Leptodira rufescens*), three Smooth-bellied Snakes (*Homalosoma lutrix*), a Many-spotted Snake (*Coronella multimaculata*), a Cape Adder (*Vipera atropos*) from South Africa, presented by the Rev. G. H. R. Fisk, C.M.Z.S.; two Macaque Monkeys (*Macacus cynomolgus* ♂ ♀) from India, deposited; six Indian Pythons (*Python molurus*), an Indian Cobra (*Naia tripudians*) from India, purchased.

ASTRONOMICAL PHENOMENA FOR THE WEEK 1889 *OCTOBER* 27—*NOVEMBER* 2.

(FOR the reckoning of time the civil day, commencing at Greenwich mean midnight, counting the hours on to 24, is here employed.)

At Greenwich on October 27

Sun rises, 6h. 48m.; souths, 11h. 43m. 55·9s.; daily decrease of southing, 4·9s.; sets, 16h. 40m.: right asc. on meridian, 14h. 8·0m.; decl. 12° 57′ S. Sidereal Time at Sunset, 19h. 5m.

Moon (at First Quarter October 31, 9h.) rises, 10h. 12m.; souths, 14h. 29m.; sets, 18h. 39m.: right asc. on meridian, 16h. 54·0m.; decl. 20° 49′ S.

Planet.	Rises. h. m.	Souths. h. m.	Sets. h. m.	Right asc. and declination on meridian. h. m.	° ′
Mercury..	5 2 ...	10 40 ...	16 18 ...	13 4·4 ...	4 56 S.
Venus.....	4 6 ...	10 4 ...	16 2 ...	12 28·0 ...	1 16 S.
Mars	2 38 ...	9 6 ...	15 34 ...	11 29·5 ...	4 46 N.
Jupiter....	12 0 ...	15 53 ...	19 46 ...	18 18·3 ...	23 29 S.
Saturn....	0 48 ...	7 54 ...	15 0 ...	10 17·4 ...	12 3 N.
Uranus ...	5 41 ...	11 2 ...	16 23 ...	13 26·4 ...	8 28 S.
Neptune..	17 58*...	1 47 ...	9 36 ..	4 9·1 ...	19 17 N.

* Indicates that the rising is that of the preceding evening.

Oct.	h.	
28 ...	23 ...	Jupiter in conjunction with and 0° 7′ south of the Moon.
31 ...	16 ..	Mercury at greatest elongation from the Sun, 19° west.

Variable Stars.

Star.	R.A. h. m.	Decl. ° ′		h. m.	
U Cephei	0 52·5 ...	81 17 N. ...	Oct. 30,	1 44	*m*
Algol	3 1·0 ...	40 32 N. ...	,, 27,	2 15	*m*
			,, 29,	23 4	*m*
U Monocerotis ...	7 25·5 ...	9 33 S. ...	,, 31,		*m*
R Cancri	8 10·4 ...	12 4 N. ...	,, 30,		*M*
U Ophiuchi... ...	17 10·9 ...	1 20 N. ...	,, 30,	21 36	*m*
X Ophiuchi... ...	18 33·1 ...	8 44 N. ...	,, 30,		*M*
β Lyræ...	18 46·0 ...	33 14 N. ...	,, 29,	20 30	*M*
			Nov. 2,	2 0	*m*
U Aquilæ	19 23·4 ...	7 16 S. ...	,, 2,	20 0	*M*
η Aquilæ	19 46·8 ...	0 43 N. ...	,, 2,	1 0	*m*
S Sagittæ	19 51·0 ...	16 20 N. ...	Oct. 29,	23 0	*M*
T Vulpeculæ ...	20 46·8 ...	27 1 N. ...	Nov. 1,	0 0	*m*
			,, 2,	2 0	*M*
δ Cephei	22 25·1 ...	57 51 N. ...	,, 1,	23 0	*m*

M signifies maximum: *m* minimum.

Meteor-Showers.

	R.A.	Decl.	
Near ε Arietis...	43° ...	22° N. ...	Slow; brilliant.
	55 ...	9 N. ...	,, ,,
,, χ Cancri	105 ...	12 N. ...	Swift; streaks.
	132 ...	22 N. ...	Very swift.

THE GEOGRAPHICAL PAPERS AT THE BRITISH ASSOCIATION.

SCIENTIFIC geography did not form a prominent feature in the Geographical Section at Newcastle. As was right and proper in so important an industrial centre, it was evidently intended to devote special attention to commercial geography. The success was only partial. It will have been seen that the President, Sir Francis De Winton, devoted a considerable part of his address to pointing out some of the important practical applications which may be made of geographical knowledge. Again, one of the ablest and most instructive papers read in the Section was by Dr. Hugh Robert Mill, on the Physical Basis of Commercial Geography. A *necessary preliminary*, Dr. Mill pointed out, to the study of commercial geography is a full acquaintance with topography, especially with the names and positions of all commercial towns. A *necessary accompaniment* to the study of commercial geography is a knowledge of the ever-varying relations between regions of supply and demand, the incidence of tariffs, and the political and social conditions of countries. The *physical basis* of commercial geography, which underlies and gives unity to the whole subject, is a knowledge of the resources of the earth as regards the various existing forms of matter and modes of energy, the best means of separating, combining, and modifying these so as to produce commodities, and the way in which commodities can be best transported. Commerce being the artificial redistribution of the matter and energy of the world, a knowledge of the general properties and the unchangeable laws of matter and energy should take a chief place in the training of commercial men. A general acquaintance with this practical science, which may be termed *applied physiography*, or *practical earth knowledge*, ought to be possessed by all merchants, and a special branch should be familiar to each. Amongst the advantages which would thus be gained are:—(1) The merchant would understand the principles of the production and manufacture of his goods. (2) He would know in many cases, without aimless and extravagant experiments, where it is possible to produce any special commodity in great abundance. (3) He could, to a great extent, anticipate the frequent changes in staple commodities by knowing what other commodities it is possible to produce in the regions now yielding the staple only. (4) He would understand the best and shortest routes between trade centres. Illustrations and arguments showing the importance of these statements were given in Dr. Mill's paper, and a large map of the commercial development of the world was shown. Dr. Mill has thus done something to give definite shape to a conception of commercial geography. The fact is, applied geography in general, like applied chemistry or applied physics, implies a sound knowledge of the subject as a science. If the facts and principles of the subject are thoroughly known, their application need not be difficult. This application cannot be said to have been very successful in Section E. The evident object in view was to exemplify by special examples the principles laid down in the President's address and in Dr. Mill's paper. Thus we had a series of papers on what purported to be the commercial geography of a number of countries or regions. The geography, however, in most cases was conspicuous by its absence. The papers were certainly most useful in their way, and doubtless would be of some commercial value. Thus Colonel Mark Bell's paper on the great Central Asian trade route from Peking to Kulja and Semrechensk, and to Yarkand and India, abounded with original information collected by an acute observer, and it is hoped will be published in full by the Royal Geographical Society. But the minute details dwelt upon by the author were quite unsuited to an audience. Mr. R. S. Gundry's review of industrial and commercial progress in China was admirable in its way, and the views enunciated by the author original and suggestive. The conclusion come to was that a more widespread desire for progress and radical financial reform will be required before China is likely to rival Japan in the completeness of its transformation.

There was as usual a considerable number of African papers, some of them really good even from the geographical standpoint. Governor Moloney gave much useful information on the Yoruba country and its various tribes, his paper, however, being mainly occupied with suggestions as to its industrial development. The same may be said of Captain Lugard's paper on Nyassaland, and Mr. Rankin's on the Zambesi. The Rev. R. P. Ashe's paper on Buganda contained little not already published in his recent work; it dealt mainly with the natives, their political organizations, their religion, manners, and customs. Captain E. C. Hore's paper on Lake Tanganyika was one of the best in the Section. The author, who has lived ten years on the lake, described its geographical position, as occupying the central depression of the heights of Africa, from the surrounding barrier of which descend the furthest sources of the great rivers; referred to its outlet, the Lukuga, and remarked upon certain earthquake phenomena, and the aspect of the depression and of the bed of the lake. He gave a general description of the lake, with the results of meteorological observations and notices of scenery, and aspects of the lake under various changes of weather. He described the natives living on the shores of the lake and within the central depression, as representing all the great African families, and gave some account of their arts and industries, and of the produce of the lake region. He sketched the African routes and lines of communication as converging towards or crossing the lake, and the present available approaches to the lake from the east coast. He then referred to the position of the lake amongst and in relation to present claims and operations in Central Africa, pointing out what European enterprise has already achieved on the lake.

An excellent paper in physical geography was that of Mr. Flinders Petrie on Wind-Action in Egypt, the results of his own recent observations in the Nile Delta. He stated that the underlying motions of the Delta are depression on the coast and upheaval at Ismailiyeh. Above these movements great changes have been made by wind-action; in some sites at least 8 feet of ground has been removed and deposited in the water. This has partly caused the great retreat of the Red Sea head, and tends to form the characteristic swamps of this district. Formerly the Delta was a desert tract, with valleys inundated by the Nile. Before historic times the Nile valley was deep in water, partly estuarine, partly fluvial, and great rainfall then took place. That this was in the human age is shown by the position of worked flints.

Mr. Batalha Reis, in his paper on recent Portuguese explorations in Africa, put in a claim for exploring activity on behalf of Portugal which it would be difficult to substantiate. Mr. E. G. Ravenstein made some important corrections in the course of the Upper Nile as laid down in recent German maps.

Mr. Basil Thomson's paper, on his recent expedition to the D'Entrecasteaux and Louisiade Islands, was the same as that given some time ago to the Royal Geographical Society, and reported in NATURE. Dr. Carl Lumholtz's paper, on the present and future of Queensland, was highly interesting and useful from a colonial point of view. He, moreover, gave some of the