Tuatera Lizard (*Sphenodon punctatus*) from New Zealand, presented by Mr. J. Catheson Smith; an Egyptian Ichneumon (*Herpestes ichneumon*) from North Africa, two Grey Ichneumons (*Herpestes griseus* ♂ ♂), two Alexandrine Parrakeets (*Palæornis alexandri*) from India, two White Pelicans (*Pelecanus onocrotalus*), South European, deposited; a Musk Deer (*Moschus moschiferus* ♂) from Central Asia, seven Bearded Lizards (*Amphibolurus barbatus*), three —— Lizards (*Amphibolurus muricatus*), a Gould's Monitor (*Varanus gouldi*) from Australia, purchased; a Barnard's Parrakeet (*Platycercus barnardi*) from South Australia, received in exchange; an Indian Muntjac (*Cervulus muntjac*), born in the Gardens.

OUR ASTRONOMICAL COLUMN.

Objects for the Spectroscope.

Sidereal Time at Greenwich at 10 p.m. on May 1 = 12h. 39m. 6s.

Name.	Mag.	Colour.	R.A. 1890.	Decl. 1890.
			h. m. s.	° ′
(1) G.C. 2917	—	—	12 18 50	−18 10
(2) δ Virginis	3	Yellowish-red.	12 50 6	+ 4 0
(3) ε Virginis	3	Yellowish-white.	12 56 42	+11 33
(4) ρ Virginis	5	Yellowish-white.	12 36 18	+10 51
(5) Z Virginis	Var.	—	12 28 12	− 3 49
(6) Comet *a* 1890, May 1	—	—	20 59 31	+30 12
,, ,, 2	—	—	58 23	+31 2
,, ,, 3	—	—	57 10	+31 53
,, ,, 4	—	—	55 51	+32 44

Remarks.

(1) During his spectroscopic survey of nebulæ in 1868, Lieut. Herschel noted that this gave a bright line spectrum. The three principal nebular lines and G were observed, but, as I have before remarked, other lines may possibly be found if carefully looked for. Some of the lines observed in other nebulæ, namely D_3 and lines near λ 559, 521, 517, 470, and 447, may be expected. In the General Catalogue the nebula is described as "Very bright; large, round; very suddenly much brighter in the middle to a nucleus; barely resolvable."

(2) According to Secchi, Vogel, and Dunér, this star has a magnificent spectrum of Group II., all of the ten ordinary bands being well visible. The band near D and the one less refrangible (Dunér's 2 and 3) are very wide, but the others are relatively narrow, though strongly marked. Dunér notices the peculiarity that band 5 (λ 546) is double. This should be further examined; the apparent duplicity may be simply due to the superposition of a strong line upon the dark fluting of lead. As the star is an exceptionally bright one for this group, comparisons with the bright flutings of carbon should be made, with the object of further confirming the cometary character of this group of stars.

(3) This is a star which has hitherto been classed with stars like the sun. The usual more detailed observations are required to determine whether the temperature of the star is increasing or decreasing.

(4) A star of Group IV. (Vogel). If the colour given by Vogel is correct, one would expect the metallic lines to be fairly well developed in this star, and it would probably be no longer classed in Group IV. The stars of this group are usually white or bluish-white, the yellowish-white stars generally falling in the later stages of Group III. or the earlier stages of Group V.

(5) The colour and spectrum of this variable have not yet been recorded, as far as I can determine, and the approaching maximum of May 5 may therefore afford a good opportunity of observing it. The range of variability is from 8·0 to 14·0 in a period of about 219 days.

(6) As this comet is travelling northwards and is gradually increasing in brightness, it may be well to note a few of the chief points to which attention should be directed in spectroscopic observations. The positions given are for Berlin midnight, and are reprinted from Nature, vol. xli. p. 571.

Observations of the spectrum of a comet at one time only are now of little value, as there can be no doubt that the spectrum is subject to changes with the variations of temperature due to varying distances from the sun. The question now is: What is the precise nature of these changes? From a discussion of all the observations made up to 1888, Prof. Lockyer has laid down what he considers to be the most probable sequence; but as yet there has been no opportunity of testing his views by continued observations of one comet. According to his view, the spectrum of a comet near aphelion is like that of a planetary nebula, consisting simply of a bright line near λ 500. This, it will be remembered, was observed by Dr. Huggins in the comets of 1866–67. As the temperature increases, the spectrum of carbon begins to appear; at first the low-temperature spectrum (perhaps better known as the spectrum of carbonic oxide) makes its appearance, and afterwards the spectrum of hot carbon (commonly known as the hydrocarbon spectrum). The principal flutings in the first spectrum are near λ 483, 519, and 561, and those in the second are compound flutings with their brightest maxima near λ 564, 517, and 473. As the temperature goes on increasing, bright flutings of the metals manganese and lead (λ 558 and 546) are added to those of carbon, the chief effect of their presence being a variation in the appearance of the band near λ 564. With a still further increase in temperature, fluting absorptions of manganese and lead replace the corresponding radiations, and apparently shift the position of the citron band from λ 564 to 558 or 546, according to the preponderance of one element or the other. At the highest temperatures, which are only attained by comets which approach very close to the sun, bright lines of sodium, iron, manganese, and other substances, appear, as in Comet Wells and the Great Comet of 1882. (For further details, see Roy. Soc. Proc., vol. xlv. p. 189.)

For comparison spectra, a spirit lamp, and small quantities of magnesium and the chlorides of manganese and lead are all that are likely to be required, unless complete measurements of wave lengths are attempted. The chief fluting in the spectrum of magnesium will serve for comparison with the line 500.

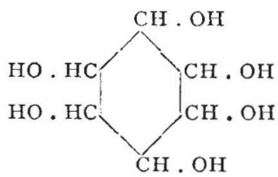
Variations in the form of a comet have not yet been associated with spectroscopic changes. A. Fowler.

Comets and Meteor Streams.—In the cases of the Leonides and Andromedes, the annexed comet appears to be at the head of the swarms, and Schiaparelli and others have inferred from this fact that a comet is broken up by tidal disturbances. Other influences besides tidal action may cause it however, and M. Bredichin, in his memoir "Sur les étoiles filantes," showed how meteorites became detached from the central condensation by explosions, and describe orbits that differ according to the value of the initial velocity towards the sun, and the angle made by its direction with the radius vector. In a later communication (*Bull. Soc. Impér. des Naturalistes de Moscou*, 1889, No. 4) the form of the orbits generated by explosions in the comet, and their relation to such meteoritic streams as the Leonides and Andromedes, has been investigated. It is noted that in general the less the eccentricity of the generated ellipse, the more clearly marked are periods of maxima in falls of meteors. With the increase of eccentricity the maxima become less marked, and in the case of a parabolic orbit feeble falls occur each year. The regular periodicity of maxima would favour the formation of a meteoritic stream by a single eruption; in some cases, however, a series of eruptions must have taken place. M. Bredichin thinks that in the Leonid stream a single eruption was excessively preponderant, in the Andromedes a series of eruptions would appear to have occurred. Other cases have also been studied in detail. A meteorite is regarded as a portion of a large comet ejected from the parent mass by an eruption, and an investigation of the number of appearances of bright meteors indicates the connection between them and shooting stars, and, as would be expected, both have maxima when the earth is passing through a meteoritic stream. Although the connection between comets and meteorites is not a matter of doubt, the above investigation demonstrates it from a new point of view. It seems most probable, however, that the disintegration of a meteoritic swarm that has entered our system is caused by tidal disturbances as well as the repulsive action which is the cause of a comet's tail.

Stellar Proper Motions.—The number of known stars having proper motions is relatively considerable, but they are much dispersed through astronomical records; M. J. Bossert, however, in the *Bulletin Astronomique* for March 1890 gives an excellent synoptical table of such stars. Many calculations are facilitated by such a table, showing the elements that may vary the position of a star; and in a research on the motion of the solar system it is invaluable. All stars are included whose annual motion is 0″·5 or more. The list has been culled from every known catalogue and astronomical record, but the results have not been accepted without an examination. Thus it is pointed out that the large proper motion given by Arago in his "Popular Astronomy" for the star in Argus, No. 2151 B.A.C., should be rejected, the comparison of Lacaille's observations with those of Stone and Gould giving, in fact, a motion of about 0″·2 for this star. The magnitude, co-ordinates for 1890·0, proper motion in right ascension and declination, the resultant motion, the direction of this motion, and the authority are given for each star.

OPTICAL ISOMERIDES OF INOSITOL.

During the last few months, whilst the brilliant researches of Prof. Emil Fischer on the synthetical production of the glucoses have been attracting so much attention, some very interesting work has been done on a compound which was formerly supposed to belong to the glucose group, viz. inosite. Maquenne, in 1887, showed that this compound, which is fairly widely distributed throughout the animal and vegetable kingdoms, is not a sugar, but a hexahydroxy-derivative of hexamethylene, having the constitutional formula—



It is an alcohol, and in accordance with the usual English nomenclature the name inosite must therefore be altered to inositol.

M. Maquenne has recently examined a compound obtained from the manna-like exudation of one of the Californian pines (*Pinus lambertiana*), and termed β-pinitol. He found that its formula is $C_7H_{14}O_6$, and that on heating with hydriodic acid it is resolved into methyl iodide and a substance which has the same composition as inositol, and resembles it in most of its properties, but melts at a higher temperature and rotates the plane of polarization to the right ($[\alpha]_D = 65$), inositol being inactive. It is therefore called *dextro-inositol*. Almost simultaneously, another French chemist, M. Tanret, obtained from quebracho bark (*Aspidosperma quebracho*) a sugar-like compound to which he has given the name quebrachitol. It has the same formula as β-pinitol, and on treatment with hydriodic acid yields methyl iodide and an inositol which can only be distinguished from the foregoing by its action on the plane of polarized light which it rotates to the left to the same extent as the first compound does to the right, and must therefore represent the *lævo-inositol*. Both these compounds crystallize with two molecules of water in hemihedral crystals, and are very soluble in water.

MM. Maquenne and Tanret then jointly examined the effect of mixing concentrated solutions of equal weights of the dextro- and lævo-compound, and obtained an inactive inositol, which is much less soluble in water than either of its constituents, and melts at a higher temperature (253°), without previously becoming plastic. From its mode of formation, its constitution must resemble that of racemic acid, and the name *racemo-inositol* has therefore been given to it. It is not identical with the inactive inositol previously known, and the latter must therefore have an analogous constitution to mesotartaric acid.

We have therefore the interesting result that inositol, a derivative of hexamethylene, exists in four different forms, corresponding exactly to those of tartaric acid.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

Cambridge.—Mr. Buchanan, the University Lecturer in Geography, announces a course on "Oceanography," to begin at 2.15 p.m. on Wednesdays. The subject will be "The Distribution of Land and Water on the Globe."

The Council of the Senate have published a report in which they withdraw their original proposal (October 22, 1888) to suspend for 10 years from 1890 the augmentation of the contributions of Colleges to the Common University Fund prescribed by the present statutes, by way of relief to the depressed finances of some of the Colleges. They propose now to discriminate between Colleges that are financially depressed and those that are not. The latter will receive no relief under the new plan, the former will be allowed to make up their University contributions by devoting one or more Fellowships to University purposes. This proposal seems to have been much more widely approved than the former, and is signed by nearly all the members of the Council of the Senate.

The Special Boards for Physics and Chemistry, and for Biology and Geology, propose a new departure in the conduct of the second part of the Natural Sciences Tripos, with regard to which there are likely to be differences of opinion. Hitherto all the work considered by the examiners has been carried on at the time of the examination under their supervision, and under equal conditions for all candidates. The proposal now is to give credit for work in practical chemistry carried on before the examination in the University or College laboratories. The regulations recommended are :—

"In the second part of the examination, every candidate in chemistry may present to the examiners, at the commencement of the examination, a record of the chemical work which he has carried out in the University laboratory, or in some one of the College laboratories, in some one term. Such record shall be the original notes made from day to day in the laboratory, with the necessary calculations in full, and dated so as to show the work of each day.

"To the record shall be appended a certificate, signed by the candidate and by the superintendent of the laboratory, stating that all the manipulations involved in the work have been *bonâ fide* carried out by the candidate alone, and that the superintendent has watched the progress of the work and believes the record of it to be faithful.

"In estimating the merits of the candidates, the examiners shall give credit for such work.

"This regulation shall be first applicable to the examination for the Natural Sciences Tripos of the year 1892."

The Report is signed by 12 members of the two Boards, the total number of members being 31. The chemists whose names appear are Prof. Liveing, Dr. Ruhemann, and Dr. Tilden.

Mr. J. Pedrozo d'Albuquerque, B.A., Scholar of St. John's College, First Class, Natural Sciences Tripos, 1887–88, has been appointed Government Professor of Chemistry at Barbadoes.

Applications for permission to occupy the University's tables in the Zoological Station at Naples, and in the Marine Biological Laboratory at Plymouth, are to be sent to Prof. Newton, Magdalene College, Cambridge, on or before May 22.

The Newall Telescope Syndicate have issued a further Report, in which it appears that a means has been found for overcoming the threatened financial difficulty. Mr. H. F. Newall, M.A., of Trinity College, University Demonstrator of Experimental Physics, and son of the donor of the telescope, has offered his services as observer, without stipend, for five years, a sum of £500 for initial expenses, and a guarantee of £200 a year for five years for maintenance, provided the University can furnish the balance of the funds required. He also offers to build himself a private house near the new Observatory, if a suitable site can be found. The Sheepshanks Fund is, moreover, able to promise an additional sum of £100 a year after five years from the present date. The outcome of these offers is that the University will only be required to find at present a capital sum of £125, and an annual subsidy of £30. After five years, it may have to build an observer's house at a cost of £800, and provide £150 a year towards his stipend. Mr. Newall has worthily seconded his father's munificence, and it is to be hoped that no further obstacle will arise to the founding of an adequate observatory of stellar physics in Cambridge.

SOCIETIES AND ACADEMIES.

London.

Royal Society, March 13.—"The Nitrifying Process and its Specific Ferment." By Percy F. Frankland, Ph.D., B.Sc. (Lond.), A.R.S.M., &c., Professor of Chemistry in University College, Dundee, and Grace C. Frankland. Communicated by Prof. Thorpe, F.R.S.

The authors have been engaged during the last three years in endeavouring to isolate the nitrifying organism.

Nitrification, having been in the first instance induced in a