on "The Rise of Man," were, in 2800 B.C., able to coast round Arabia and up the Red Sea to Suez. Why should they not be able a few hundred years later to coast round Africa and Spain and up the Atlantic to Britain?

In 2800 B.C., according to the same authority, the Akkadians were acquainted with silver, gold, bronze, and copper.

One of the most recent theories of the stone circles that of Sir Norman Lockyer—is that they were astronomical observatories, by means of which the ancient priests made observations of the sun and stars, and were thereby able to regulate the calendar, to foretell and prepare for the festival seasons of the year, and to tell the time at night.

This theory is in remarkable agreement with the anthropometrical conclusions which I have just submitted to you, for the Akkadians were apparently the first inventors of astronomy. Gudea, the Akkadian prince, who lived about 2800 B.C., has left a stepped pyramid with an observatory on the top. The Akkadians were the astronomical race at the dawn of civilisation, and apparently the ideas of an astronomical race have been embodied in our British stone circles.

THE BRITISH ORNITHOLOGISTS' UNION.

THE British Ornithologists' Union celebrated its fiftieth anniversary in the rooms of the Zoological Society on anniversary in the rooms of the Zoological Society on Wednesday, December 9. A special meeting was called for the occasion, the president of the union, Dr. F. D. Godman, F.R.S., occupying the chair, and reading an address on the history of the union from its foundation. The idea of forming this society was due, he remarked, to the late Prof. Newton, and was first mooted in his rooms at Cambridge during 1858; but it appears finally to have taken shape when, in the following year, at the meeting of the British Association at Leeds, the oppor-tunity was seized of calling together a number of the tunity was seized of calling together a number of the ornithologists there assembled. The details of the con-stitution of the union appear to have been then discussed, and a few months later took their final shape. Limited for the first few years of its existence to twenty members, it was at last found expedient to remove this restriction. To-day more than four hundred members are on the roll. From the first it was decided to start a journal, and the name chosen for this was that of the sacred bird of Egypt, name chosen for this was that of the sacred bird of Egypt, the *Ibis*. The history of the birth and growth of this now celebrated journal was traced later by Dr. Sclater, its first and present editor. After the addresses by the president and Dr. Sclater, gold medals were presented to the four survivors of the original founders, Dr. Godman, Mr. Percy Godman, Dr. Sclater, and Mr. W. H. Hudleston. This pleasant ceremony was followed by an appeal to the members from Mr. Ogilvie Grant, of the British Museum (Natural History) wherein he urged that British Museum (Natural History), wherein he urged that the union should commemorate its jubilee by sending an expedition to explore the Charles Louis Mountains of New Guinea, probably one of the richest unexplored zoological regions of the world, and this was unanimously agreed upon. The union, of course, could not find the whole of the money necessary for such an undertaking, but a considerable sum has been promised by others interested in this work. The meeting was brought to a conclusion by a dinner held at the Trocadero Restaurant, after which Mr. Boyd Alexander gave a lecture on his recent journey across Africa, and this was followed by a kinematograph exhibition of pictures of bird life.

At a special general meeting, held in the same week, the union considered the report of a committee on a motion brought forward by Mr. H. F. Witherby at the last annual meeting. It was then proposed that the taking or killing of certain birds, or the taking of any egg of certain birds, or the purchase of any such egg knowing it to have been taken in the British Islands by any member of the union, should involve the removal of his name from the list of members. The prohibition with regard to birds was to apply all the year round to the bearded-top golden oriole, hoopoe, marsh harrier, hen harrier, Montagu's harrier, common buzzard, golden eagle, white-tailed eagle, kite, hobby, osprey,

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common bittern, spoonbill, Kentish plover, avocet, and chough. To the crested tit, snow-bunting, grey-leg goose, dotterel, red-necked phalarope, ruff, whimbrel, black tern, Sandwich tern, roscate tern, great skua, black-throated diver, red-throated diver, and greenshank it was only to apply for the breeding season, but it was to be in force for the eggs of any of the species named. After discussion, it was agreed that if in the opinion of the committee any member shall have personally assisted in or connived at the capture or destruction of any bird, nest, or eggs in the British Isles, by purchase or otherwise, likely in the opinion of the committee to lead to the extermination or serious diminution of that species as a British bird, steps shall be taken, after due inquiry, to remove the offender's name from the list of members.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

THE Most Rev. Dr. Walsh, Roman Catholic Archbishop of Dublin, has been elected Chancellor of the new National University of Ireland.

THE Berlin correspondent of the Daily Chronicle announces that Prof. Ernst Haeckel, professor of zoology at the University of Jena, is about to retire into private life after forty-eight years' professorial activity. He will be succeeded by Prof. L. Plate, professor of zoology in the Berlin Agricultural High School.

UNIVERSITY COLLEGE, Reading, has issued a special list of courses in poultry keeping to be given there, with practical training at the college poultry farm, Theale, inclusive of theoretical and practical teaching in this subject. Additional lectures are given by members of the staff on zoology, soils, manures and pastures, chemistry of foods, and bookkeeping.

THE current number of the *Empire Review* includes an article on the Imperial College of Science and Technology by Dr. Henry T. Bovey, F.R.S., the rector of the college. After giving a brief historical *résumé* of the growth of the Royal College of Science, the Royal School of Mines, and the Central Technical College, Dr. Bovey explains the work of the Departmental Committee appointed by the Board of Education in 1904, the issue of the charter of July 8, 1907, creating the Imperial College, and the constitution of the governing body. The aims and objects of the new college are then dealt with, and in this part of his article the rector follows very closely the able address he delivered to the students at the opening of the session last October, which was published in full in our issue for October 15 last (vol. lxxviii., p. 613).

THE Department of Agriculture and Technical Instruction for Ireland has arrived at an agreement with the Commissioners of National Education in Ireland for providing means for the training of national-school teachers in elementary experimental science and domestic economy as part of local schemes of technical instruction. The Commissioners are prepared to recognise teachers, who hold certificates of satisfactory attendance at classes approved by the Department, as qualified to give instruction in the subjects named. The Department has circulated copies of the regulations which will govern the classes to be inaugurated and syllabuses of courses of instruction in both subjects. Each course extends over three years, is well graduated, and skilfully adapted to the needs of teachers in elementary schools. The third year's course in elementary experimental science provides instruction in rural economy, and it is so framed that in a few years' time Ireland should possess elementaryschool teachers able and desirous of basing the science teaching of country schools upon the everyday surroundings and experiences of the children.

THE annual prize distribution at the Sir John Cass Technical Institute was held on Wednesday, December 16, when the chair was taken by Sir Owen Roberts, chairman of the governing body. The prizes were distributed by Mr. Lewis F. Day, after delivering an address, in which he dealt with the mutual dependence of design in art and craft work and their relation to trade, and concluded with a statement of his views as to the aim and end of technical training. Mr. Day pointed out the value of the association of the work of the science side of the institute with the study of the artistic crafts and with the bearing of science upon design. It was, in his opinion, of great value to develop so far as possible a more intimate association than ordinarily exists between different branches of teaching, so as to familiarise the craftsman with the methods, the aims, and the applications of science. Previous to the distribution of the prizes, Mr. George Baker, chairman of the institute committee, in reporting on the work of the past session, referred to the fact that the prizes that had recently been presented to the institute by the Goldsmiths' Company for the department of metallurgy had been awarded for the first time. The first of these prizes was given for the best piece of research work carried on in the department of metallurgy during the past session, and he recorded with great interest that three very satisfactory investigations had been done during that period.

THE issue of the Oxford and Cambridge Review for the Michaelmas term contains an unusually large number of articles dealing with subjects connected with higher educa-tion. Dr. F. C. S. Schiller discusses exhaustively the whole question of scholarships at the public schools and the universities under the title of "Eugenical Scholar-ships." The particular title adopted is justified, because the discussion of scholarships and the schools are schools and the schools and the schools and the schools are schools are schools and the school are schools are schools are schools and the school are schools ar the thorough examination of recent proposals to restrict public scholarships to the children of poor parents leads up to a consideration of the matter from the point of view of eugenics. Intelligence and ability, says Dr. Schiller, are hereditary; the probability of getting able children is vastly greater if they spring from able parents; intelligence and ability lead to success among professional men; for men so situated the institution of scholarships is simply invaluable, since it acts as a great eugenical inducement, and is calculated to augment the supply of valuable citizens. Mr. R. J. MacKenzie, late rector of Edinburgh Academy, in an article on school examinations, points out how the multiplicity of examining bodies all examining for similar purposes leads to waste of time, money, and energy in secondary schools, and pleads for a universal "secondary-schools' leaving examination" for England and Scotland. The same issue of the Review contains an essay entitled "The Idealistic Interpretation of Prof. Ostwald's Theory of Energy," by Mr. J. Butler Burke, and articles on other educational matters.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, June 25.—" Dichloro-urea." By Dr. F. D. Chattaway, F.R.S.

There is probably no substance among the almost bewildering number known to chemists which surpasses urea in interest, or which has been more frequently and carefully investigated. It has been so much studied from almost every point of view that a new simple derivative was scarcely to be expected. Such a new simple derivative is, however, found in the recently discovered chlorine substitution product.

This is produced when chlorine is passed into a cooled saturated aqueous solution of urea. Action takes place without any considerable development of heat, and a compound crystallises out in which two of the four hydrogen atoms of the parent substance are replaced by halogen. Dichloro-urea obtained thus is a soft, white crystalline powder, consisting of thin transparent plates, which can be preserved for a considerable time in a dry atmosphere, although, as might be expected, it is not very stable.

Having regard to its composition and mode of formation, as well as to the structure of urea itself, its constitution must be represented by the formula

$$_{Cl}^{H}$$
 N-CO-N $<_{Cl}^{H}$

which explains its formation and such of its reactions as have yet been studied. From this structure, and the

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fact that heat is absorbed when it is formed, it might be expected to be highly explosive. When heated, however, it does not itself explode, but decomposes at about 83° C. with liberation of the vapour of nitrogen chloride. The latter, if it is not allowed to escape, and if the temperature is raised a few degrees higher, detonates with great violence.

Dichloro-urea is a compound of a marked acid character; it has a sour taste, recalling that of hypochlorous acid, and its aqueous solution strongly reddens litmus paper, which only becomes bleached after the lapse of some minutes. It acts very corrosively upon the skin, staining it yellow and destroying the tissues, and gives all the reactions characteristic of compounds in which chlorine is directly attached to trivalent nitrogen. It is distinguished from most other substances belonging to this class of compounds by the readiness with which it is hydrolysed, nitrogen chloride, carbon dioxide, a little nitrogen, and ammonium chloride being produced.

Dichloro-urea is instantaneously decomposed by a solution of caustic potash, two-thirds of the contained nitrogen being liberated as gas with violent effervescence, while the remaining one-third appears as ammonia, which, together with the alkaline carbonate also formed, remains dissolved in the liquid.

This behaviour of dichloro-urea gives an insight into the course of the reaction which occurs when urea is decomposed by an excess either of alkaline hypochlorite or hypobromite. This decomposition, which has received an extraordinary amount of attention, as it furnishes a quick though not very accurate, method of estimating the quantity of urea present in a liquid, has never been properly explained, and is generally represented by an equation which makes it appear to be a case of oxidation. Dichloro- or dibromo-urea or some analogous compound is without doubt formed as an intermediate product, the action being thus one of halogen substitution followed by decomposition of the substituted urea by the excess of alkali present.

It may be noted that dichloro-urea is safe to handle, and promises to be of considerable use as a synthetic agent.

Royal Astronomical Society, December 11.-Mr. H. F. Newall, F.R.S., president, in the chair.-The determination of the apparent diameter of a fixed star: Major P. A. MacMahon. But little certainty is to be attached to existing estimates of the diameters of fixed stars, and a direct method, independent of the star's parallax, is much to be desired. The author proposed to apply the principle of the bioscope to the photography of occultations of stars by the moon. It was shown that a star might have an apparent diameter of 1/1000th of a second, and that the apparent diameter of r/roooth of a second, and that the time taken by the moon to occult a fairly bright star might give an approximate measure of such a diameter. Prof. Dyson said he entirely agreed with the principle of Major MacMahon's method, and hoped that results might be obtained in the case of bright stars occulted by the dark limb of the moon. It would be necessary to employ a reflecting telescope of large aperture, and extremely sensitive plates.—The **Astronomer Royal** showed further photographs of comet c 1908, Morehouse, in continuation of the series exhibited at the last meeting. carrying the of the series exhibited at the last meeting, carrying the record to November 25, after which the moon interfered, and the comet got too low. The structure of the tail still showed detail of great interest, including the apparent dark rifts, though the cyclical changes seen in September dark rifts, though the cyclical changes seen in September and October did not appear to continue. A further series of photographs of the comet, taken by Prof. Barnard at the Verkes Observatory from October 16 to November 19, was also shown.—The comet of 1556: its possible break-ing up by an unknown planet into three parts, seen in 1843, 1880, and 1882: Prof. George **Forbes**. The three latter comets formed a group, closely related to each other, and the author gave his reasons for considering that the disruption of the comet of 1556 occurred through the influence of an ultra-Neptunian planet, which his calcula-tions showed to exist at a mean distance from the sun of about 100 celestial units, with a period of about 1000 years and an inclination to the ecliptic of about fifty degrees. Some search had been made for the supposed planet, but only in the region of the Zodiac, so it was not surprising that the results had been negative .- An