larger cubes; on replacing the little cubes by spheres in contact the model represented in the second picture (Fig. 5) is produced.

Now this crystalline mineral, zinc blende, has been chosen advisedly as an example of crystal structure. For a remarkable series of experiments have recently been carried out by Laue, Friedrich, and Knipping at Munich, where the lecturer had the advantage of seeing some of the first photographic results last summer. In these experiments X-rays were passed through crystals of various substances, notably zinc blende, and, in more recent experiments by Laue at Zurich,

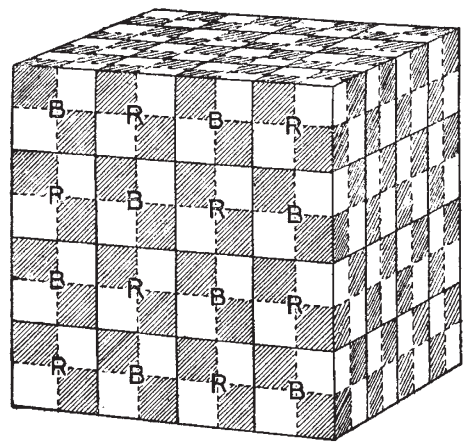

FIG. 6.—Scheme of tetrahedral arrangement of zinc (B) and sulphur (R) atoms in zinc blende. Unshaded cubes unoccupied.

quartz. The issuing rays were received on a photographic plate, on which they recorded a pattern of spots having the symmetry (full holohedral) of the space-lattice present as the foundation of the crystal structure. These interesting photographs thus afford the first experimental and visible proof of the truth of the structure assigned to crystals by geometricians and crystallographers.

(*To be continued.*)

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

BIRMINGHAM.—At the annual Degree Congregation the degree of Doctor of Science was conferred on the following:—E. E. Fournier d'Albe, Hamilton McCombie, George William Todd, and Donald Levy. The occasion was also marked by the unveiling of a fine portrait of the Chancellor (the Right Hon. Joseph Chamberlain), the generous gift of Mrs. Chamberlain, "as a token of my own interest in all that concerns the University, and my earnest hope that future generations will see it develop into all that its founders dreamed of when it was established."

EDINBURGH.—The honorary degree of LL.D. was conferred on July 4 by the University on Mr. H. A. L. Fisher, Vice-Chancellor of the University of Sheffield; Emeritus Professor Greenfield; Sir James Guthrie; Lord Justice Hamilton; Mr. John Stewart, Nova Scotia; Prof. F. Strassmann, Berlin; Prof. J. Arthur Thomson; the Hon. James Wilson, Washington, U.S.A.; and (*in absentia*) Prof. Thomas Gilray, University of Otago, N.Z.

Prof. C. G. Barkla, F.R.S., professor of physics in the University of London (King's College), has been appointed to the vacant chair of Natural Philosophy, in succession to the late Prof. J. G. MacGregor.

PROF. J. W. JUDD, C.B., F.R.S., has been appointed emeritus professor of geology in the Imperial College of Science and Technology by the council of the college.

MR. ANDREW CARNEGIE has intimated to M. Liard, Vice-Rector of the University of Paris, that he will give 4000*l.* towards the construction of the new chemical institute which is being erected in the Rue Pierre-Curie, Paris.

DR. L. H. BAILEY, widely known as the chairman of President Roosevelt's commission on country life, has resigned the post of head of the New York State College of Agriculture, Cornell University, after a tenure of ten years. He has held the professorship of agriculture at Cornell since 1883. Dr. Bailey is resigning in order to secure more time for research.

AMONG recent Irish appointments we notice that Prof. Gregg Wilson, professor of zoology in Queen's University, Belfast, has been appointed a member of the first Senate of the University in succession to the late Prof. John Park. Mr. Edgar H. Harper has been appointed professor of mathematical physics in University College, Cork, and Mr. E. W. Hoare lecturer in veterinary hygiene in the same college.

RECENT changes at Johns Hopkins University include the promotion of Dr. J. E. Gilpin, now associate professor of chemistry, to be collegiate professor, and of Mr. E. W. Berry, now associate in palæobotany, to be associate professor of palæontology. Prof. D. S. Johnson is appointed to the directorship of the botanical laboratory and the botanical garden, and Prof. Burton E. Livingston to the directorship of the laboratory of plant physiology.

COLUMBIA UNIVERSITY and Rutgers College receive bequests which may amount to 200,000*l.* each as principal beneficiaries under the will of Mrs. Mary B. Pell, the widow of John H. Pell. *Science* states that each beneficiary received a direct bequest of 40,000*l.* and an interest in large trust funds amounting to more than 400,000*l.* The fund for Columbia is to erect Pell Hall, in memory of the late Mr. Pell, who was a student of Columbia. From the same source we learn that Princeton University has received 20,000*l.* from Mrs. Russell Sage toward the construction of a dining-hall; and that the College of Agriculture of Cornell University has received a State grant of 90,000*l.*, and a grant of 14,000*l.* for the veterinary college. A part of the additional grant this year is to be used for increasing salaries.

RECENT correspondence between the Maharaja of Darbhanga, who is at the head of the movement to create a Hindu University in India, and Sir Harcourt Butler, the education member of the Governor-General's Council, has, we learn from *The Times*, been published. The Maharaja points out that the subscriptions promised amount to more than 533,333*l.*, of which about 140,000*l.* has been received. Taking into account the capital value of certain grants of property and annual payments in perpetuity granted by three ruling chiefs, he estimates the amount in hand, or which may be safely taken as already in hand, to be not far short of 400,000*l.*, exclusive of the value of the Central Hindu College at Benares. He claims that a good case had been made out financially for the Government to take into consideration the legislation necessary for bringing the University into being. Sir Harcourt Butler has replied that the matter is still under consideration; but he thinks it will be of assistance to the promoters to know the conditions which the Government of India regards as precedent to the introduction of any scheme. These are the provision of a suitable site; the transfer of the Central Hindu College to the University; and the

collection of not less than 333,333*l*. In this amount may be included the capitalised value of the property mentioned by the Maharaja, and the perpetual grants by three ruling chiefs, provided that the documentary title is satisfactory in the case of the latter, and the possession of the property has been made over in the case of the former. The further conditions are that the constitution of the University should proceed on lines to be indicated by the Government, and that a committee be appointed to report whether the Central Hindu College is fit to be developed into a residential and teaching university.

THE unusual increase in the number of women attending German universities, as shown by statistical returns recently issued in Germany, is of particular interest in view of the fact that women were only admitted as students in the summer of 1905. A note in the issue for July 4 of the Journal of the Royal Society of Arts states that during 1912 the number of women students in German universities has grown from 2795 to 3213, and the percentage of women now in the universities, as compared with the whole student body, is 5·4 per cent., as against 2·7 per cent. three years ago. Of the present body of women students the great majority—2900—come from Germany. Of the foreign women, Russia furnishes more than a third, America about a fourth, and other European countries most of the others. Few women students come from Asia, Africa, or Australia. The University of Berlin alone has more than one-fourth of the total women students of the Empire, the exact number of women in the large universities at present being:—Berlin, 904; Bonn, 289; Munich, 262; Göttingen, 237; Heidelberg, 219; Freiburg, 189; Münster, 172; Breslau, 150; Leipzig, 129; Marburg, 126; Königsberg, 107; Greifswald, 83; Halle, 81; Jena, 65; Strassburg, 52; Kiel, 40; Tübingen, 38; Giessen, 24; Erlangen, 21; Würzburg, 16; Rostock, 6; all others, 3. The departments of study to which the women students give preference are about the same as in former years, the enrolment in certain courses being:—Medicine, 702; mathematics and natural sciences, 579; economics and agriculture, 91; dentistry, 17; and pharmacy, 8.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, June 26.—Sir Ronald Ross, K.C.B., vice-president, in the chair.—F. S. **Phillips**: Phosphorescence of mercury vapour after removal of the exciting light.—Dr. G. J. **Burch**: Light sensations and the theory of forced vibrations.—P. W. **Burbidge**: The fluctuation in the ionisation due to γ rays.—J. G. **Leathem**: The force exerted on a magnetic particle by a varying electric field.—Dr. W. **Watson**: The luminosity curve of a colour-blind observer.—Prof. W. M. **Hicks**: A critical study of spectral series. Part iii.: The atomic weight term, and its import in the constitution of spectra.—L. C. **Martin**: A band spectrum attributed to carbon monosulphide. A complex band system occurring in the spectrum of the electric discharge through carbon disulphide vapour in addition to the bands due to sulphur, is also found in the spectrum given by sulphur in the carbon arc. These bands only occur in the presence of both sulphur and carbon, and are probably due to carbon monosulphide.—Igerna B. J. **Sollas** and Prof. W. J. **Sollas**: The structure of the skull of Dicynodon as revealed by serial sections. The structure of the skull has been demonstrated in a remarkably complete manner by reconstructions built up from serial sections. A single example has afforded nearly all the information which has been slowly accumulated from numerous specimens during the past half-century and has added the following facts, which are either new or were in need of confirmation:—(1) The vomer is grooved on its dorsal surface; (2) the basis cranii is continued forwards between the orbits as a median vertical plate, which lies in the groove of the vomer, and is itself grooved on the dorsal surface to receive the ventral edge of the mesethmoid; (3) the form of the mesethmoid is such as to suggest that it is an early stage in the formation of a cribriform plate; (4) septo-maxillary bones are present, lying within the internal nares without appearing on the face. They are not connected by suture with neighbouring bones and might easily be lost in fossilisation; (5) the preparietal bone is present, situated entirely in front of the pineal foramen and forming its anterior border; (6) a transverse bone exists, clearly marked off from the neighbouring bones by sutures; (7) the root of the tusk, invested by a thin layer of the maxillary bone, lies in a large cavity, to the walls of which the maxillary, lachrymal, jugal, and palatine bones contribute; (8) the sutures separating the pro-otic from neighbouring bones are clearly exhibited; (9) the labyrinth of the ear shows all the three canals with their ampullæ and a long vestibule; (10) the articular surface of the lower jaw is complex, there is a small inner portion which is concave—as in reptiles, and a large outer portion which is convex—as in mammals.—W. **Cramer** and R. A. **Krause**: Carbohydrate-metabolism in its relation to the thyroid gland. The effect of thyroid feeding on the glycogen content of the liver and on the nitrogen distribution in the urine.—Dr. G. W. C. **Kaye** and D. **Ewen**: The sublimation of metals at low pressures.—Dr. R. T. **Beatty**: The energy of Röntgen rays.—Dr. C. **Chree**: Some phenomena of sun-spots and of terrestrial magnetism. Part ii. The paper is a continuation of one termed for brevity S.M., which appeared in the Phil Trans., A. 212, p. 75. It is mainly devoted to the question of the existence of a period of approximately twenty-seven days in terrestrial magnetic phenomena. Independent studies of magnetic storms during a very long period of years at Greenwich and Toronto led Mr. Harvey and Mr. Maunder a good many years ago to the conclusion that an interval of about twenty-seven and a quarter days could be recognised between the commencements of successive magnetic storms in a greater number of cases than could reasonably be ascribed to pure chance. S.M. showed that whether one took the daily range of horizontal force at Kew, or the magnetic character of the day, there undoubtedly existed for the epoch 1890 to 1900 a period of twenty-seven days or slightly more, in the sense that if an individual day were highly or moderately disturbed, days twenty-seven or twenty-eight days later were on the average more disturbed than usual. The result was not peculiar to the large disturbances usually termed "magnetic storms," and appeared in all the years examined, whether quiet or disturbed. The present paper finds the same result to hold true of the years 1906 to 1911 when use is made of the magnetic "character" figures which have been published since 1906 at de Bilt, under international auspices. It is also found that the result is as true of quiet as of disturbed characteristics. The paper also investigates whether the phenomena presented by the twenty-seven-day period vary with the period of the year, and what the relationships are, if any, between magnetic "character" and Greenwich measures of sun-spot area and faculæ and Wolfer's sun-spot frequencies. The apparent sun-spot relationships are found to vary a good deal from year to year.—A. **Fowler**: New series of lines in the spark spectrum of magnesium. From experiments on the spectrum of the magnesium arc *in vacuo*, it has been