to pack all parcels of instruments with especial reference to caravan travel, as otherwise repacking in Trebizond would be necessary and much delay occasioned. Two hundred pounds is too heavy, and it is better if no package exceed 150 lb., as a mule must carry two of them; the average load is about 300 lb. As a mule must have a perfectly balanced load, it is well to have the paraphernalia so divided that pairs of packages will be of the same weight. The nearer a parcel approaches a cube, the easier it is to handle, though moderately oblong packages are not particularly troublesome. Packing must, of course, be done much more thoroughly than for transit by railway and steamship, as the continued motion of a pack animal will cause screws and delicate parts of instruments to disconnect themselves. I have found nothing better for packing than granulated cork, such as Malaga grapes are packed in.

As before said, travel so far as Erzerum can be accomplished in fairly comfortable carriages, and even a rubber-tyred vehicle is possible. Baggage might go in a species of lumber wagon, or springless vehicle; but beyond Erzerum carriages would not go, except at great expense. From Trebizond to Erzerum eight days of travel should be allowed, by starting promptly every morning. From Erzerum to Bitlis would require eight or nine days; and before leaving either Trebizond or Erzerum, it is necessary to make the drivers or muleteers agree to arrive at the desired place on a certain day; then, in addition to this, the traveller must keep prodding them to see that they make their schedule. They much prefer to travel in the very early morning, starting from three to five o'clock. The journey from Erzerum to Bitlis cannot be called an easy one; but the country and its people are very interesting.

The eastern end of the plain of Moush is a day's journey from Bitlis on the route to Erzerum, and on this plain at this time of year the American residents of Bitlis usually spend two or three quiet and healthful months in camp.

To the west of Bitlis and far outside the path of totality, although in the same generally elevated region of Turkey, is Kharput, where records of cloudiness for the month of August have been kept for many years past. The average for five years gives 70 per cent. of the afternoon observations in August entirely cloudless, with not a single record of a sky totally overcast. Most of the cloudiness is of the order of 0·1 or 0·2, only occasionally an afternoon being largely overcast. These afternoon observations were taken at 2.30, and there is a slightly greater chance of cloudiness at 4.

For most of the foregoing information I am indebted to the Rev. Dr. Henry H. Riggs, of Kharput, Dr. Harrison A. Maynard, of Bitlis, Rev. Robert A. Stapleton and Dr. Edward P. Case, of Erzerum, and Rev. L. S. Crawford, of Trebizond. All are greatly interested in the coming eclipse, and are ready to assist in observing it so far as possible.

Prof. A. G. Sivaslian, of Anatolia College, Marsovan, will proceed eastward to the Trebizond region to observe the eclipse. He is an astronomer trained at the Northfield Observatory in Minnesota, and will be of great assistance to whatever party of observers he may join; also Prof. A. H. Joy, of the Syrian Protestant College at Beirut, is expecting to join the ranks of the eclipse observers, but he may go to the Crimea instead of Trebizond.

Of course, it is well known that Trebizond is very accessible. The easiest route from western Europe is *viâ* Marseilles, whence a weekly steamer of the Messagerie leaves for Trebizond without change at Constantinople or elsewhere. The same from Trieste also, by the Austrian Lloyd. From Paris the through rate by rail to Marseilles, and thence by steamer to Trebizond is about 14*l.* first class. From Constantinople steamers leave every Friday and Saturday, reaching Trebizond the following Tuesday and Wednesday mornings.

Fuller information regarding the Persian region can be obtained from the house of Messrs. Lynch Brothers in London, and concerning Armenia the standard work is by the late senior member of this firm, Mr. H. F. B. Lynch, recently published in two fine volumes by Longmans. DAVID TODD.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—The completion of the third edition of The Golden Bough" has suggested to the many friends and admirers of Dr. J. G. Frazer that the present is a suitable time to offer him some token in recognition of his great services to learning. It is proposed that a Frazer Fund for Social Anthropology be established to make grants to travelling students of either sex, whether connected with a university or not, with a view of their investigating problems in the culture and social organisation of primitive peoples, a department of anthropology which Dr. Frazer has always been eager to promote. Contributions to the fund may be sent either direct to the secretary and treasurer, Mr. F. M. Cornford, Trinity College, Cambridge, or to the "Frazer Fund Account," Messrs. Barclay and Co., Mortlock's Bank, Cambridge.

LONDON.—Presentation Day on May 13 passed off without special incident. The Principal reported a slight falling off of examinees, particularly for matriculation. Of the 1807 candidates for degrees 900 were internal and 907 external; 1301 degrees and diplomas were granted, and the total number of internal students is now 4888. Sir Philip Magnus, M.P. for the University, in his speech after the presentation of graduates, suggested that a committee of the Senate should be appointed to consider without prejudice or bias the recommendations of the Royal Commission on University Education in London with the view of deciding which of them should be adopted with or without legislation.

MR. ALFRED E. CAMERON, Board of Agriculture scholar in entomology, of Manchester University, has taken up economic work in the United States, where he is temporarily attached to the entomological department of the New Jersey Agricultural Experiment Stations, New Brunswick, New Jersey.

MR. MALCOLM E. MACGREGOR, of Trinity College, Cambridge, has recently been appointed collaborator with the U.S. Bureau of Entomology, to join the Robert M. Thompson Pellagra Commission (formerly the Thompson-Macfadden Pellagra Commission), at Spartenburg, South Carolina, to study the possible rôle played by insects in the transmission of the disease.

WE learn from the Paris correspondent of the *Chemist and Druggist* that the council of the University of Paris has just decided to distribute 3600*l.*, being interest of a bequest by the late M. Loutreuil for the encouragement of scientific laboratories of French universities. The Chemical Institute of Nancy University is receiving 400*l.* for extension and enlargement, and Toulouse 800*l.* for the foundation of a similar establishment. Montpellier University will

get 160*l.* for its biological laboratory, Rennes 320*l.* for the botanical and physical science laboratories, Lille, Clermont, and Grenoble are getting goodly sums for electrical equipment, and Paris 100*l.* for the herbarium of the Academy of Sciences.

THE Association of Teachers in Technical Institutions will hold its eighth annual conference at Liverpool during Whitsuntide, May 30–June 3. The open meetings begin on Monday, June 1, when the chairman of the Liverpool Education Committee, Councillor J. W. Alsop, will welcome the conference to Liverpool, and the president, Mr. P. Abbott, will deliver his presidential address. During the conference papers will be read by Mr. W. Hewitt, director of technical education for Liverpool, Prof. Haldane Gee, Mr. W. E. Harrison, Mr. Laurence Small, Mr. W. R. Bower, and others. Sectional meetings will be held on the afternoon of June 2, when papers of special interest to the various sections of technical education will be read. Resolutions on matters of educational and professional interest will be discussed at the various meetings.

A LIMITED number of free places at the Imperial College of Science and Technology, South Kensington, S.W., will be awarded by the London County Council for the session 1914–15. The free places will be awarded on consideration of the past records of the candidates, the recommendations of their teachers, the course of study which they intend to follow, and generally upon their fitness for advanced study in science as applied to industry. Candidates will not be required to undergo a written examination. It is possible that the free places may be extended to two or more years. Parents (or guardians) of candidates must be resident within the administrative county of London, except in the case of self-supporting candidates above twenty-one years of age on July 31, 1914, who must themselves be resident within the county. Application forms (T. 2/268) may be obtained from the Education Officer, L.C.C. Education Offices, Victoria Embankment, W.C., and must be returned not later than Saturday, May 23.

IN addition to much other matter of interest and importance, the recently published Report of the Board of Education for the year 1912–13 (Cd. 7341), contains particulars as to the main provision for full-time education in connection with the industries of the country. This has been provided in the past either by means of advanced courses known as technical institution courses at the larger technical schools, or by means of day technical classes, which, as a rule, take younger pupils and give more elementary instruction. There are twenty-six institutions giving technical institution courses, the total number of separate courses in these institutions being eighty-one in 1911–12. But of these twenty-two were courses in preparation for matriculation. Fifty-four were courses in engineering, chemistry, and subjects connected with the building, mining, textile, and leather trades. Five were purely scientific courses. The number of students taking full courses was 1246, of whom 528 were in their first year, 414 in their second year, 245 in their third year, and fifty-nine in later years of their courses. The number of day technical classes recognised in 1911–12 was in all 324, and these were held in 111 institutions. The students in attendance numbered 12,041. One hundred and fifty-four of the courses were full-time day schools, and these will in future receive aid from the State to a degree more commensurate with their importance. The report may well point out that the provision for full-time education in applied science is regrettably small in bulk compared with the industrial development of the country.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, May 14.—Sir William Crookes, president, in the chair.—Dr. A. D. **Waller**: The various inclinations of the electrical axis of the human heart. Part IA.—The normal heart.—Effects of respiration. Continuation of previous observations (Phil. Trans., 1889, p. 169) in which the electrical effects of the human heart were first demonstrated, and the distinction made between favourable and unfavourable leads dependent upon the obliquity of the cardiac axis, and of subsequent observations (Proc. R.S., B, vol. lxxxvi., p. 507, 1913) to determine the angular value of the inclination of the electrical axis.—Dr. D. H. **Scott** and Prof. E. C. **Jeffrey**: Fossil plants showing structure from the base of the Waverley Shale of Kentucky. The specimens were collected by Prof. C. R. Eastman and Mr. Moritz Fischer, near Junction City, Boyle County, Kentucky. The nodule layer containing the plants is described by Prof. Eastman as lying at the base of the Waverley (Lower Carboniferous) and immediately above the Genessee Black Shale of Upper Devonian age. The anatomical structure is, on the whole, well preserved.—F. **Kidd**: The controlling influence of carbon dioxide in the maturation, dormancy, and germination of seeds. Part ii. The inhibitory effect of carbon dioxide on the germination of seeds previously described is dealt with in relation to temperature and oxygen supply. In relation to temperature the result obtained is unusual, the inhibitory action being more pronounced at low temperatures than at high. At 3° C. complete inhibition was obtained with 4 per cent. CO_2; at 17° C. as much as 24° C. had to be employed to obtain the same result. Varying partial pressures of oxygen also effect the inhibitory action of carbon dioxide, but to a less degree than temperature. Thus with 5 per cent. oxygen, 15 per cent. CO_2 produced inhibition; with 20 per cent. oxygen, 27 per cent. CO_2 was necessary. The author emphasises the fact that the adjustments of the moist seed by which it is enabled to continue dormant in the presence of oxygen and water, rather than those of the dry seed, are likely to have formed the central problem of seed life in nature. A low temperature and a decreased oxygen supply are often the natural conditions of a seed's environment in the soil. Correlating the results obtained in this and in a former paper, the author strongly emphasises the controlling influence of carbon dioxide in the biology of seeds. It appears that the normal resting stage of a seed is primarily a phase of narcosis.—D. **Thomson** and J. G. **Thomson**: The cultivation of human tumour tissue *in vitro*. Small portions of tissue from two human tumours, (*a*) intracystic papilloma of the ovary, and (*b*) carcinomatous lymphatic gland, have been cultivated successfully in a medium composed of fowl blood plasma + extract of embryonic chick. This proves that human tissue can be grown *in vitro* in a medium obtained entirely from a bird. This is contrary to what was previously believed, since it was considered that the tissue of a certain animal could only grow in a medium composed of the blood plasma of the same species of animal.—H. G. **Thornton** and G. **Smith**: The nutritive conditions determining the growth of certain fresh-water and soil protista. Experiments made on the growth of *Euglena viridis* in artificial media showed that, in addition to those inorganic constituents necessary for the growth of a green plant, which were supplied by Miguel's formula for growing diatoms, a certain quantity of organic material, *e.g.* infusion of hay, was necessary. In order to determine the constituent in this organic material which stimulated growth, various pure sub-