

own particular playing-ground without a mate. The play-grounds are cleared from dead leaves and other débris, and decorated with large fresh leaves placed face downwards. The leaves used are of various kinds, though sometimes only one kind may be found in a particular play-ground. The work of decoration is carried out afresh every morning, the leaves of the previous day being thrown on one side and new ones substituted. "Up to 6 a.m. they appeared to be hard at work clearing their bower floors of the old leaves and re-carpeting them with fresh ones, and until this early house-work was done they appeared to be in little mood for song or mimicry. I came across them hard at their re-furnishing, and carrying the long, heavy leaves in their bills *by the stems*, and just as they had severed them from the trees." The birds feed upon a kind of red berry, not yet identified, and the author is inclined to think that the serration of the beak has nothing to do with the collection of food. It is, however, apparently of use in cutting or sawing off the leaves for the decoration of the playing-ground, as was actually observed.

The tooth-bills are wonderful mimics, and Mr. Jackson gives a graphic account of their vocal performances. They seem able to imitate almost all the characteristic sounds of the forest, from the distinctive notes of other birds to the "pulsating rattle of a captured cicada."

After many disappointments the nests were at length found in very tall trees, very loosely constructed of twigs and containing only two eggs of a uniform brown colour. The character of these eggs leads the author to the conclusion that the tooth-bill is really a cat-bird, and not a true bower-bird at all. We cannot refrain from quoting the description of the finding of a pair of these eggs:—"The nest is placed fully 90 feet from the ground, in a mass of dense vegetation at the top of a bean or scrub chestnut-tree (*Castanospermum australe*). The climb is an awkward one, and our best black, who had examined the nest in the first instance, is again chosen to tackle the task. Strapping the egg-pouch around his waist, I say 'Good luck!' and up he goes. Placing the perpendicular and suspended vines between the first and second toes of each foot, he simply walks up, with marvellous and un-firing agility. Making his way through the masses of vines and foliage near the top, he at length gains the rare nest, and suddenly exclaims, 'Two pfeffer heg sit down!'"

Although the tooth-bill was the main object of the author's quest, the account of his wanderings contains much interesting information about other birds and some very good photographs, and is well worthy of perusal by all field naturalists.

INTERCHANGE OF UNIVERSITY STUDENTS.

IN July last (vol. lxxxi., p. 55) we directed attention to a scheme, which is in course of development, to provide an interchange of university students between the United Kingdom, Canada, and the United States. It was pointed out on that occasion that the objects in view are to enable as many as possible of the educated youth of the countries named to obtain some real insight into the life and customs of other nations at a time when their own opinions are forming, with a minimum of inconvenience to their academic work and the least possible expense. The scheme will afford technical students facilities to examine into questions of interest to them in manufactures and so on, by observation in other countries, and will allow men of one part of the Empire to realise the needs and potentialities of the others.

Among the immediate needs of the executive committee in charge of the scheme, it may be mentioned that, to cover the estimated expenses of twenty-eight annual travelling scholarships, and of two students' travelling and information bureaux (one in Great Britain and one in America) for a provisional period of three years, in which the value of the scheme can be successfully demonstrated, a total sum of 13,000*l.* is needed. This is to be raised in three amounts, proportionate to the expenses incurred:—from the United States, 4500*l.*; from Canada, 1800*l.*; and from the United Kingdom, 7500*l.* There is not likely to be any difficulty in raising the money required in Canada and the United States. British students will incur more expense

than others on account of the distances to be covered on the other side by the scholars, who will travel through Canada to the Pacific coast and return *via* the United States.

The committee hopes to be able to complete the organisation so that exchanges may be effected for 1910. To enable this to be accomplished, the treasurer (Lord Brassey) should receive promises to the amount of 7500*l.* within the next month.

Thanks largely to the practical support of the president of the movement (Lord Strathcona), who combines the Chancellorships of Aberdeen and McGill Universities with his work as High Commissioner of Canada, a central office has been established at Caxton House, Westminster. The travelling students will have the advantage of reduced rates of travel, of the special information which the bureau will be able to afford, and of the privilege of being brought, so far as possible, into contact with the actualities of those countries to which they go, whether persons, places, or institutions. A publication of great utility in connection with the movement will be compiled by the bureau.

The arrangements for the other side of the Atlantic also have made good progress. There is to be a bureau in New York under the direction of an American secretary, while at either Montreal or Toronto there will be a representative of the Central Bureau established in London, which forms the headquarters of the movement and the centre for the British Empire. In this connection, also, it may be mentioned that hopes are entertained of the opening in London of a common room for the convenience of the students concerned. The movement has been taken up by prominent educationists and others in the United States and Canada. Under the direction and guidance of the bureau the scholars, selected in the manner previously described, will travel for ten weeks during the long vacation through the respective countries. In order to elicit close observation, a detailed report of the tour will be required from every scholar. Donation forms, and all further information, can be obtained from the honorary secretary, the International Interchange of Students, Caxton House, Westminster, S.W.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

WE learn from the *Revue scientifique* that the inauguration of the new Swiss university at Neuchatel took place on October 19. The University has grown out of the Neuchatel Academy, which was founded in 1866 and was re-organised in 1894.

MAJOR CRAIGIE, the Gilbey lecturer at Cambridge in the history and economics of agriculture, will give two lectures on "The History of Canadian and Australian Development and its Effect on British Agricultural Conditions" on November 17 and 18, at 5 p.m., in the University Chemical Laboratory.

PROF. PERCIVAL has resigned the directorship of the department of agriculture and horticulture of University College, Reading, and has been appointed to the post of professor of agricultural botany. Mr. Ronald V. O. Hart-Synnot has been appointed director of the department of agriculture and horticulture in succession to Prof. Percival.

THE trustees of Princeton University, we learn from *Science*, have accepted the gift of 100,000*l.* of Mr. W. C. Proctor, of Cincinnati, made on condition that an equal sum be obtained by May 1, 1910. Haverford College has received 20,000*l.* to establish a fund for pensioning its professors. The General Education Board in the United States has made a conditional grant of 25,000*l.* to Ohio Wesleyan University, at Delaware, O. Mrs. Charles E. Perkins, of Burlington, Ia., has given 6000*l.* to Harvard University, to establish scholarships for students from Iowa. Harvard University also has received gifts amounting to 1320*l.*, to be used for the immediate benefit of freshmen in Harvard College.

THE President of the Board of Education received a deputation from the County Councils Association Rural Education Conference on November 3. At a meeting last July the conference passed resolutions in favour of manual

training, such as handicraft and gardening for boys and needlework and cookery for girls. On behalf of the deputation, Mr. Hobhouse explained that the resolutions were intended to express a widespread and growing feeling that elementary education should be brought into closer touch with the practical activities of daily life. The agricultural classes have hitherto been unduly prejudiced against the present system of elementary education as being mere book-learning, tending to unfit children for industrial occupations and calculated to produce only clerks and errand boys. The resolutions state that in the opinion of the conference it is not only desirable, but essential, that some form of manual training shall be given in every elementary school and throughout school life. It is often impossible, in the first place, to find teachers qualified to give the necessary instruction. The second difficulty is that of buildings and equipment. Wherever possible in rural schools a room should be provided and a plot of ground secured for practical instruction. Thirdly, while in concentrated populations the present grants for special subjects may be adequate, they are quite insufficient as regards scattered populations. In his reply, Mr. Runciman said the object of the Rural Education Conference may be summed up shortly—that it is sought to make the education of the children in the public elementary schools more practical and less bookish, to make it, in fact, deal more with things than with ideas, and to adapt it more to the special requirements of particular localities. With these objects he said he is in general sympathy, and the Board of Education has shown its approval of them by the changes it has made in the curriculum. The Board has attempted, so far as possible, to encourage the experiments enumerated by the conference; the real pity is that the experiments are so few. This is the fault of the teachers and the local authorities. Even in cases where the equipment is so small that it is impossible to carry on the work, the Board has done what it can to encourage the work of the peripatetic teachers. The gardening classes in elementary schools, as shown in the statistics of his department, have largely increased in number of recent years, and only within the last few weeks an important new departure has been made in arranging for the coordination of the work of the Board of Education with that now done by the Board of Agriculture.

LORD ROSEBERY, as Chancellor of Glasgow University, presided on November 5 at a dinner of the Glasgow University Club, London. In proposing "The University and the Club," Lord Rosebery remarked that there is nothing more interesting at this moment in the non-political aspect of England than the sprouting up of new universities all over the country. This shows an uprising of an intellectual interest which is full of promise at a time when all in the future of this country does not seem equally happy in expectance. These universities are the result of a real desire on the part of the people to partake of the higher, and perhaps even more of the technical, education that the universities afford. The universities are an outward and visible sign of a grace which is not likely to remain inward, but is likely to show itself in the influence of our national destinies. Lord Rosebery later remarked that he cannot help watching with an intense and almost a timid interest the outcome of the teaching of the universities. The destinies of this country are likely to be moulded indefinitely for good or for evil, in the course of the next few years, by the men of ability, and still more the men of character, who rise in each generation to mould their fellows. He hopes that the University of Glasgow will have many such missionaries of Empire, many men who are prepared with strong backs to wrestle and to stand for the truth, to oppose error in whatever place they may find it, and to remember that though they may be working in their own professions, for their own aims most of their time, yet there is part of their time which they owe to the traditions of their own university and to the welfare and future of the Empire itself. Lord Rosebery believes that Oxford and Cambridge have a great task still before them in the advancement of studies which must always appeal to a large, a leisured, and a learned section of the nation; but he is doubtful if grafting on to the ancient institutions newer technical

schools is likely to answer to them or to the schools which they are attempting to found. Every university has, or should have, a character of its own, and the characters of Oxford and Cambridge are so strongly marked out, and they have so venerable a tradition to support them, that they need no special modern adjuncts, and Lord Rosebery doubts that they are likely to profit by them much, for, in truth, on the new grounds they cannot compete with the newer universities. The newer universities were founded with the object of promoting those practical and technical branches of knowledge for which the increasing demands of the age have gradually called.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, November 4—Sir Archibald Geikie, K.C.B., president, in the chair.—Colonel Sir David Bruce, Captains A. E. Hamerton and H. R. Bateman, and Captain F. P. Mackie: (1) The development of *Trypanosoma gambiense* in *Glossina palpalis*; (2) a note on the occurrence of a trypanosome in the African elephant.—The Lord Rayleigh: The perception of the direction of sound.—Prof. H. M. Macdonald: The diffraction of electric waves.—R. Houston: The mechanism of the absorption spectra of solutions.—Hon. R. J. Strutt: (1) Note on the spontaneous luminosity of a uranium mineral; (2) the accumulation of helium in geological time, ii. The second paper is a continuation of that published in Proc. Roy. Soc., A, vol. lxxxi., 1908, p. 272, the object being to determine the ratio of helium to radio-active matter in minerals as a means of measuring their age. The data given refer chiefly to the iron ores of sedimentary strata. Even some of the most recent are found to contain quantities of helium, denoting great antiquity. Thus ironstone from the Eocene beds of Co. Antrim contains, per gram, 2.64×10^{-4} grs. uranium oxide (U_3O_8), 8.27×10^{-4} grs. thorium oxide, and 12.1×10^{-4} c.c. helium. This, interpreted according to the best available data, would imply an age of thirty million years. Experiments of a preliminary character have been made to determine directly the rate of growth of helium in thorianite and in pitchblende. The data thus obtained will give the rate of formation of helium by the complete series of uranium and thorium respectively, and thus make it possible to interpret more definitely the results of experiments on other minerals for which a direct determination is not feasible; 400 grams of thorianite was found to yield in seven weeks a quantity of helium certainly less than 2×10^{-6} c.c. The annual rate of production per gram of thorianite is, therefore, certainly less than 3.7×10^{-8} c.c. The 9 c.c. initially present cannot, therefore, have accumulated in a less time than 250 million years. An experiment on pitchblende of a similar character was consistent with Rutherford's estimate of the rate of production by the uranium series, but was not on a sufficient scale to afford complete confirmation. Experiments on a larger scale are in progress.—J. C. Chapman and H. L. Porter: The physical properties of gold leaf at high temperatures.—Dr. H. C. Pocklington: The dimensions and function of the Martian canals. The nature of the bed of the canals is guessed from Lowell's value of the velocity of flow along them, and then the depth is calculated from the technical formulæ, assuming that the canals are horizontal and carry water from pole to pole. The depth is 500 feet if the canals are as narrow as possible, or 370 feet if they are 4500 feet wide. The amount of water required to fill the canals is determined. To find the function of the canals, it is assumed that their arrangement is the most economical, and it is deduced that they are essentially lines of communication, though, of course, they may also serve to carry water for irrigation.

Physical Society, October 22—Dr. C. Chree, F.R.S., president, in the chair.—F. E. Smith: Cadmium amalgams and the Weston normal cell. Cadmium amalgams may be solid, liquid, or a mixture of solid and liquid phases, the composition of the phases depending on the temperature. When a liquid amalgam is cooled below the lower transition temperature, the centre of the resulting solid is of high cadmium concentration, and the outer skin of low cadmium concentration. Diffusion tends to pro-