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The Universities and International Relations.¹

IN the United States, the Government takes no part in the promotion of international interchanges of students and teachers, except in a negative sense—through the application of the laws restricting the immigration of aliens; but several powerful corporations do very energetically encourage such interchanges. The activities of the American University Union in Europe (London and Paris) and the American Council on Education, in which the Union is now merged, are well known. The Council's *Educational Record* of April gives particulars of 76 American organisations in the field of international educational relations. One of these, the Institute of International Education, founded in 1919, administers a large number of scholarships for students of various nationalities, makes grants for expenses of foreign travel to American professors on leave of absence, publishes guide-books for foreign students in the United States and for American students in foreign countries, holds educational conferences, and serves as a clearing-house for information relating to international education. It has, moreover, fostered the formation of clubs for the discussion of international relations in American universities.

The Rockefeller Foundation devotes vast sums to the endowment, largely by means of international fellowships and grants to foreign universities, of study and research in medicine and hygiene. "International House," opened in 1924 in New York as a residential club to accommodate 500 students from all parts of the world, was built by Mr. J. D. Rockefeller, Jun. This philanthropist founded in 1923 an "International Education Board," which has established the International Institute of Teachers College, Columbia University, and endowed it with an annual grant of 100,000 dollars a year for ten years. The work of this institute comprises the exposition of American ideals and institutions as a basis for understanding American education, instruction in American systems of pedagogy and their adaptation to foreign situations and problems, and visitation of American schools. In 1923, some 250 foreign students were availing themselves of these facilities for "becoming intellectual subjects" of America, and there were also in attendance 100 Americans who held posts as teachers in other countries. Other appropriations of the International Education Board, amounting in all, up to June 30, 1924, to more than six hundred thousand dollars, include 60 science fellowships for workers in 17 countries.

In 1921 the number of foreign students in United States colleges and universities was 8357. In the same

¹ Continued from p. 523.

year, the universities of Germany, which, before the War, had more than those of any other country, had 6334. This, considering the troubled condition of the country, is a surprisingly large figure. The close relations formerly existing between German and American universities have not yet been restored, but steps in this direction have been taken. The International Institute of the University of Heidelberg for the study of English and American institutions has on its advisory council eleven eminent representatives, including several presidents, of American universities; it invited the Director of the Institute of International Education to be the council's chairman.

The American Commission for Relief in Belgium was responsible for founding in 1920 the Fondation Universitaire in Brussels with a capital of 55 million francs. This foundation, in addition to its other activities, makes grants for study in American universities to Belgian graduates and vice versa, and arranges exchange visits of professors. The American - Scandinavian Foundation provides 40 travelling fellowships of a thousand dollars each for travel and study by American graduates in Scandinavian universities and vice versa. In Spain, the oversight and direction of all matters relating to State scholarships tenable abroad, exchanges of teachers and students, bursaries in connexion therewith, and courses for foreign students, are entrusted to the Junta para Ampliación de Estudios e Investigaciones Científicas. This body has established a Spanish Institute in New York, which is housed in the offices of the Institute of International Education.

In Great Britain and Ireland the international interchange of university students and teachers is encouraged neither by the State as in France, Italy, and Spain, nor, with the exception of the Rhodes Scholarship Trust, by great corporations as in the United States. There are, however, a number of travelling fellowships and scholarships established in connexion with some of the universities, and since 1922 the National Union of Students of the universities and university colleges of England and Wales has been active in promoting foreign travel of English students and their intercourse with students abroad.

It is sometimes assumed that international interchange of students must necessarily tend to promote international amity through dissipating prejudices and misconceptions, but it is by no means always the case that the impress on the mind of the university student of the contacts he makes when sojourning in a foreign university has this desirable tendency. The same may be said of the impressions produced by university students and teachers visiting foreign institutions. Quality is all-important, and measures undertaken for the indiscriminate multiplication of interchanges may

do much harm to the cause their authors wish to promote. This principle was fully recognised in the framing of the Rhodes scholarships scheme and its new American counterparts, and it should never be lost sight of by those whose duty it is to award scholarships tenable in foreign countries.

It is, on the other hand, important that the visitors should have sufficient opportunities of participating fully in the social as well as the academic life of the university. To those who fulfil its matriculation requirements, the university opens its doors and thenceforward treats them all alike without respect to race, creed, or nationality. The ordinary matriculation requirements are, moreover, relaxed in favour of students who, having been educated abroad, are not prepared to pass the ordinary English matriculation examinations, but have qualified for admission to a foreign university. For the university to show still further solicitude for the interests of foreign students as such by making special provision for their social well-being would be inappropriate and liable to misconstruction. Their special needs, however, have been made the subject of sympathetic consideration by several bodies not officially connected with the universities, notably the Student Christian Movement, the National Union of Students, and the League of Nations Union.

In relation to such matters as the provision of opportunities for social intercourse, obtaining suitable accommodation in term and during vacations, the help afforded to foreign students by these bodies is of great value. Discussions promoted by the National Union of Students have stimulated among student bodies an increasing interest in international relations: an interest which has led to the formation of "Hospitality Committees," which have invited parties of about half-a-dozen students of universities in Germany, France, Czecho-Slovakia, Denmark, and Norway to visit English universities during term. As a rule, one party is invited each term. On arrival the visitors become the guests of English student organisations, thus being saved all expense of board and lodging, and are given an intimate view of English life in the universities; in some cases even railway travelling expenses have been borne by hosts. The period of stay in each university varies from three to ten days. Universities that have already entertained in this way are Cambridge, Oxford, London, Liverpool, Birmingham, and Leeds. To some extent these visits are of a reciprocal character, student bodies in foreign universities offering similar hospitality to parties of English students, but there is nothing in the shape of bartering in connexion with them, the invitations being in every instance free, unconditional, and spontaneous, and actuated by a desire to promote good feeling between the nations.

Finally, mention must be made of certain organisations which are international not only in their activity, like the bodies already mentioned, but also in their constitution: The Committee on Intellectual Co-operation of the League of Nations, with its University Information Office; the Confédération Internationale des Étudiants, formed at Strasbourg in 1919; the International Federation of University Women, founded in 1920; and the World's Student Christian Federation. All these in different ways work for international harmony through improved mutual understanding, and cultivate a certain detachment from the national point of view and a spirit of mutual toleration, which are indispensable preliminaries for co-operation. Education is, no doubt, a peculiarly favourable field for international co-operation in certain conditions; for example, there is now a valuable opportunity for co-operation between Great Britain and China; but to what extent internationally constituted bodies are suitable instruments for organising such co-operation is doubtful. Owing to the diversity of their constituents, they are likely to be less effective in some respects than national bodies such as the American Institute of International Education.

Recent Atomic Theory.

- (1) *The Theory of Spectra and Atomic Constitution: Three Essays.* By Prof. Niels Bohr. Second edition. Pp. x+138. (Cambridge: At the University Press, 1924.) 7s. 6d. net.
- (2) *Vorlesungen über Atommechanik.* Von Prof. Dr. Max Born. Herausgegeben unter Mitwirkung von Dr. Friedrich Hund. (Struktur der Materie in Einzeldarstellungen, 2.) Erster Band. Pp. ix+358. (Berlin: Julius Springer, 1925.) 15 gold marks.
- (3) *Zeemaneffekt und Multiplettstruktur der Spektrallinien.* Von Dr. E. Back und Prof. Dr. A. Landé. (Struktur der Materie in Einzeldarstellungen, 1.) Pp. xii+213+2 Tafeln. (Berlin: Julius Springer, 1925.) 14.40 gold marks.

THE structure of the atom will be generally admitted to provide the most fruitful and important field of work in modern physics, but even so it can be but rarely necessary to welcome simultaneously three books of such importance dealing with this one subject. Let us extend to the three at once the warmest possible welcome, and proceed to consider separately their individual contents, and the light that they throw on the recent trend of speculation in atomic theory.

(1) It is convenient to consider first the reprint of Prof. Bohr's three essays, to which, in this edition, an

appendix has been added describing shortly later developments which correct and amplify certain earlier statements, particularly in the third essay. The theme of this whole book may be called the "central orbit" theory of the atom, originated by Prof. Bohr, and developed largely by Prof. Sommerfeld and himself. The theory sets out to co-ordinate the main features of atomic structure, spectra, and other properties on the basis of a classification of the orbits of the electrons in the atom into groups, specified by the two quantum numbers n and k , which must characterise any orbit in a conservative central field of force, not obeying the law of the inverse square. Purely electrostatic forces must still give rise, by a screening effect, to such deviations from the inverse square. The success of this theory is now a commonplace. The development of any significant theory consists of two parts of equal importance—the determination of the field of facts which the theory can successfully correlate, and the determination of the field of facts which, by their very nature, must lie outside the domain of the theory. In the case of the central orbit theory, as these essays and their appendix now make abundantly clear, these domains are already well defined. The dividing line lies at that point at which it is necessary to introduce a third quantum number to account for optical and X-ray ("relativistic") doublets. Questions such as these are essentially connected with the interactions between one electron and others in an atom. Bound up with them are all the questions connected with the closing of electronic groups and sub-groups, the numbers of electrons in these groups, chemical combinations (other than of ionic type), and the insistent manifestations of half-quantum numbers. These matters lie necessarily outside the domain of the central orbit theory, and the modification of theory necessary to meet them is not yet clear. It is clear only that it must be fundamental.

Great progress has already been made in this wider domain, thanks largely to the study of the Zeeman effect and its partial but strikingly successful interpretation in terms of a magnetically coupled system of core and series electron. But this is not enough. These, however, are matters deliberately excluded from Prof. Bohr's book, for which we may naturally turn to Profs. Back and Landé. In the field proper to the central orbit theory, its success has been singularly rapid and complete. Quantum numbers n and k can be specified with certainty for all electronic groups and all (or nearly all) X-ray and optical terms (in the simpler spectra), and the general features and properties of the atom are convincingly represented. There remain only many interesting points of detail, especially in the assignment of quantum numbers for certain optical