

IMPERIAL COLLEGE OF SCIENCE AND TECHNOLOGY.

THE draft of the Charter for the incorporation and government of the Imperial College of Science and Technology to be established at South Kensington has now been laid on the table of the House of Commons. It provides for the appointment of a governing body which, when complete, will consist of forty members, each member holding office for a period of four years. The governing body will be constituted in accordance with the recommendations of the Departmental Committee which reported in January, 1906. When complete, it will consist of forty members, of whom six will be appointed by the Crown, four by the President of the Board of Education, five each by the University of London, the London County Council, and the City and Guilds of London Institute, two by the Royal Commissioners for the 1851 Exhibition, one by the Royal Society, four by the professorial staff of the college, and eight by various technical societies, viz. one each by the Institutions of Civil Engineers, Mechanical Engineers, and Electrical Engineers, the Iron and Steel Institute, the Institution of Naval Architects, the Society of Chemical Industry, the Institution of Mining Engineers, and the Institution of Mining and Metallurgy. The President of the Board of Education will summon the first meeting of the governing body, which will be deemed to be constituted on the occasion of that meeting. The governing body will meet at least four times a year, and will publish a report of its proceedings annually. It will be permitted to delegate powers to an executive committee and to other committees, provision being made for the possible inclusion on any of these committees, except the executive committee, of non-members of the governing body. The governing body will in this way be able to secure the advice of independent experts, including persons with practical experience of industrial requirements. Advisory boards may also be appointed with the same object in view.

The purposes of the Imperial College will be to give the highest specialised instruction and to provide the fullest equipment for the most advanced training and research in various branches of science, especially in its application to industry, and to do all or any of such things as the governing body consider conducive or incidental thereto, having regard to the provision for those purposes which already exists elsewhere. For these purposes the governing body will carry on the work of the Royal College of Science and the Royal School of Mines (at present under the direct control of the Board of Education), and may establish colleges or other institutions or departments of instruction. Any institution or department so established, and, subject to the fulfilment of certain conditions, the Central Technical College of the City and Guilds of London Institute, will become integral parts of the Imperial College. The special conditions attaching to the affiliation of the Central Technical College have for their object to secure for the college a certain measure of independence. The college, which will in future be known as the City and Guilds College, will be managed—subject to such powers of general supervision, direction, and control as are reserved for the governing body of the Imperial College—by a committee of management appointed for the purpose by the City and Guilds of London Institute, to which committee the governing body of the Imperial College will add five additional members; and the Institute will continue to exercise its privilege of awarding the diplomas of Associate and Fellow. As already announced by Mr. McKenna, the Royal School of Mines will retain its name, and the governing body of the Imperial College will award the diploma of "Asso-

ciate of the Royal School of Mines" to any student who completes the prescribed courses to the satisfaction of the governing body. Subject to agreement with the authorities of any college or other institution, the governing body may by resolution recognise that college or institution or any department thereof as being in association with the Imperial College, but no such resolution will be valid or operative until allowed by His Majesty in Council. Power will be reserved to His Majesty in Council to amend or add to the provisions of the Charter, and in particular to declare and define more precisely the purposes and scope of the Imperial College in relation to matters appertaining to the biological sciences, and to make such provision in reference thereto as may appear expedient.

As regards the connection between the Imperial College and the University of London—a matter which has been fully discussed during the past year—it is proposed that, pending the settlement of the question of the incorporation of the Imperial College with the University, the college shall be established, in the first instance, as a "school" of the University. It is expected that an inquiry by Royal Commission, which has been suggested by Mr. McKenna, will be necessary before this question of incorporation can be decided. In the meantime, the governing body of the college will be directed to enter into communication with the University with regard to the coordination of the work of the college with the work of the University and its other schools, and for the purpose of carrying out or facilitating such coordination the governing body may enter into such arrangements either by way of transferring or exchanging departments of instruction or otherwise, and upon such terms as may be agreed upon between the governing body and the University.

The resources which are at present available for the purposes of the Imperial College are considerable. In the first place, there are the buildings and equipment of the Royal College of Science, including the new chemical and physical laboratories, which have cost nearly 300,000*l.* The Royal Commissioners of the 1851 Exhibition have resolved to appropriate certain portions of their estate at South Kensington for the purposes of the college. The late Mr. Alfred Beit bequeathed 50,000*l.* and 5,000 preferred shares of 2*l.* 10*s.* each in De Beers Consolidated Mines (total value about 135,000*l.*) to be applied for the purposes of the "College for Technology (including Mining and Metallurgy) in connection with the University of London." Lord Rosebery, in a letter to *The Times*, published on June 29, 1903, announced that Messrs. Wernher, Beit and Co. had offered to place a sum of money in the hands of trustees to be applied as a contribution towards the cost of building and equipping an institution at South Kensington for advanced technology, and that further offers of the same kind had been made by other public-spirited London citizens. The Bessemer memorial fund, which will probably amount to not less than 20,000*l.*, will be devoted in whole or part to the Royal School of Mines. As regards income, the Treasury has consented to place in the Estimates a grant of 20,000*l.* per annum in respect of the cost of the staff and of laboratory expenses of the Royal College of Science and the Royal School of Mines. The London County Council, which in the past has not contributed generously in aid of higher technological work, may be expected to avail itself gladly of the opportunity of developing such work in London which the establishment of the Imperial College will afford, especially in view of the fact that the Council is now under a legal obligation to consider the educational needs of its area, and may supply or aid the supply of higher education. The Council on

July 21, 1903, considered Lord Rosebery's letter, to which reference has already been made, and placed on record its opinion that, when certain conditions had been complied with, the Council would be well advised to contribute out of the money annually placed at its disposal under the Local Taxation (Customs and Excise) Act of 1890 a sum not exceeding 20,000*l.* per annum towards such part of the work described in Lord Rosebery's letter as fell within the statutory definition of technical education. Although the conditions are now entirely changed, there is no reason to suppose that the annual contribution of the Council to the college will be less than that suggested four years ago. The Board of Education will pay the fees for its selected scholars, and the fees payable by other students will amount to a considerable sum. It is expected that the resources of the Central Technical College will also be available. The total expenditure on this college for buildings, fittings, &c., has exceeded 130,000*l.*, and the current expenses of the college (about 15,000*l.* per annum) are met by the fees of students and a subvention from the City and Guilds of London Institute. The total value of the land, buildings, equipment, and capital available for the Imperial College (including the Central Technical College) will certainly exceed one million pounds.

The assets in the way of teaching staff and students also deserve mention. The teaching staff of the colleges includes such well-known men of science as Profs. Tilden, Callendar, Perry, Watts, Gowland, Cox, Ayrton, Armstrong, Dalby, and Henrici. At the Royal College of Science and the Royal School of Mines the total number of students is about 300; a high standard for entry is not at present demanded, and the proportion of students preparing for university degrees is comparatively small; but a large number of able students are entered at the college under the Board of Education system of national scholarships for science students. At the Central Technical College the number of regular students is about 375; the test for admission is approximately equivalent to London Matriculation, and a fairly large number of students are reading for London degrees as internal students of the University.

#### THE BUTTERFLIES OF INDIA.<sup>1</sup>

THE second volume of Colonel Bingham's important work on the butterflies of India includes the Papilionidæ and Pieridæ, and five out of the seven subfamilies into which the author divides the Lycænidae "provisionally . . . on the structural characters of the imago or perfect insect." These subfamilies are Gerydinæ, Lycæninæ, Curetinæ, Liphyrinæ, Poritinæ, Theiclinæ, and Arhopalinæ, of which the last two stand over until the next volume. The tables and descriptions are very carefully drawn up, and the illustrations, both coloured and uncoloured, the latter often representing venation, legs, and other important structural characters, are worthy of high praise. Some of the text-figures of large species are reduced. The transformations, broods, habits, flight, scent, stridulation, &c., of various butterflies are also fully discussed, especially the curious relationships between Lycænidae and their larvæ and ants and aphides. We notice, however, that references to the transformations of common European species have generally been omitted; we are not certain whether this is done to save space

<sup>1</sup> "The Fauna of British India, including Ceylon and Burma." Published under the Authority of the Secretary of State for India in Council. Edited by Lieut.-Colonel C. T. Bingham. Butterflies, vol. ii. By Lieut.-Colonel C. T. Bingham. Pp. viii + 430; plates xi-xx. (London: Taylor and Francis, 1907.)

(for it might have been thought hardly necessary to repeat information to be found in every European book on butterflies) or because Indian records of the transformations of these particular species happen to be wanting.

Notwithstanding the care with which the book is written, we notice an occasional oversight; for instance, the range of the genus *Colias* is incompletely given, as it is found in Lapland, South Africa, and other localities which would seem to be excluded by the wording of the paragraph. Perhaps the newest and most interesting observation in the book is that recorded by Colonel H. J. W. Barrow, R.A.M.C., who observed a *Lycænide* (*Allotinus horsfieldi*) "milking" an aphid in the same manner as if the butterfly had been an ant (p. 287, Fig. 73). The description of the tentacles of the larvæ of *Curetis bulis* (p. 445) is also quite original and very curious, as is also the long account of the carnivorous larva of the very anomalous *Liphyræ*

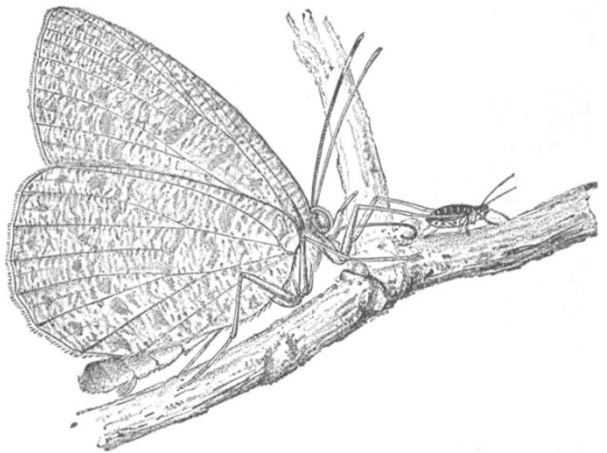


FIG. 73.—*Allotinus horsfieldi*, attending an Aphide. From "The Fauna of British India. Butterflies, vol. ii."

*brassolis* (pp. 448-56), but the latter particulars have mostly been published before.

It will be seen that there is much in Colonel Bingham's volume which appeals to the general naturalist, and not merely to the lepidopterist.

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#### THE ROYAL SOCIETY CONVERSAZIONE.

THERE were numerous interesting exhibits at the Royal Society conversazione on May 8. The guests were received by the president, Lord Rayleigh, and included representatives of many departments of intellectual activity.

During the evening, demonstrations were given in the meeting-room of the Society by Mr. Louis Brennan, C.B., Dr. C. G. Seligmann, and Dr. Hele Shaw, F.R.S. Mr. Brennan explained the principle and action of his mono-railway by means of a working model. On his system each vehicle is provided with automatic stability mechanism which endows it with the power of maintaining its equilibrium upon a single rail laid upon the ground, either while standing still or travelling at any rate of speed, notwithstanding that the centre of gravity of the vehicle is above the rail, and that wind pressure, centrifugal force, or the movement of passengers or displacement of load may tend to upset it. This mechanism consists of two gyroscopes, revolving in opposite directions, and their precession, by being accelerated, produces a restoring couple at right angles to the rail. The same principle