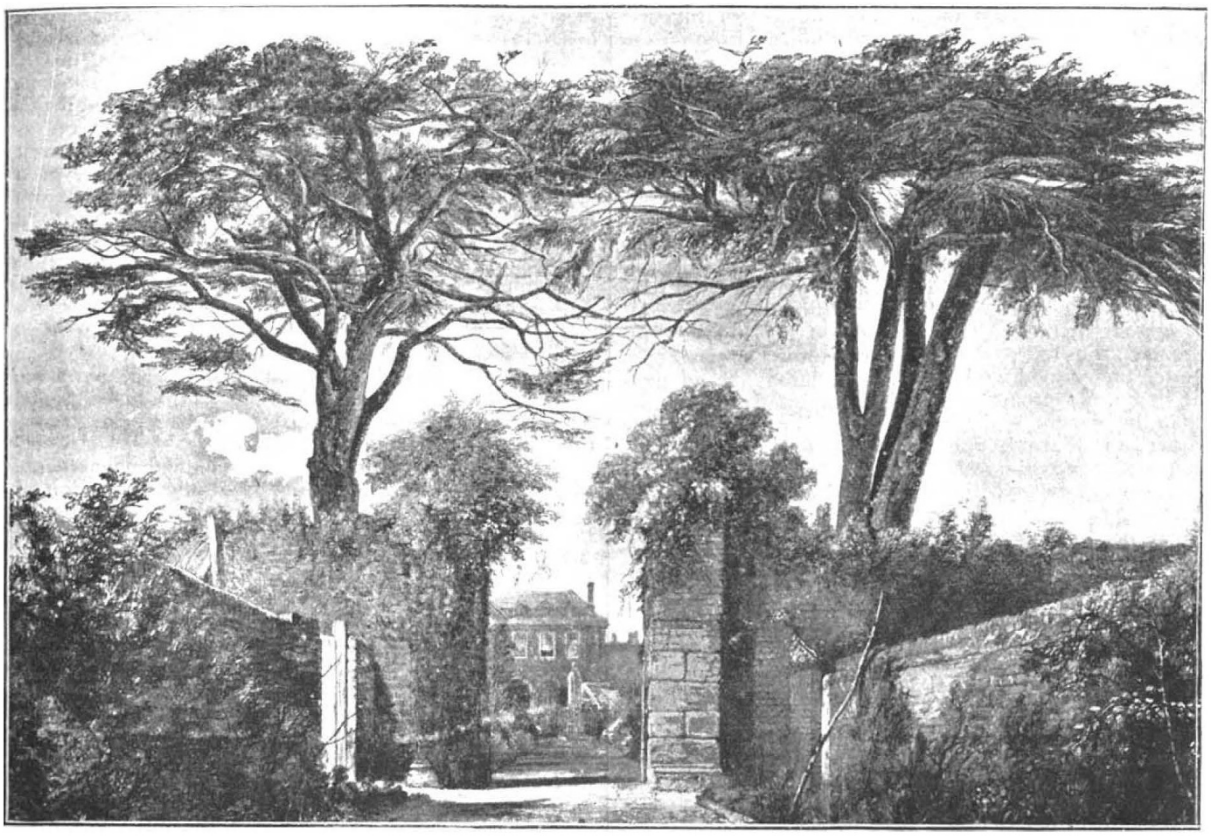
LONDON BOTANIC GARDENS.[1]

THIS little work comprises in book form a series of articles contributed to the *American Journal of Pharmacy* by Mr. P. E. F. Perrédès in 1905 and 1906. Written by a pharmaceutical chemist to a pharmaceutical journal, these papers naturally devote attention primarily to the relationship of the London botanic gardens to the art of pharmacy. In tracing the origin of botanic gardens to the private gardens of the herbalists of the sixteenth and seventeenth centuries, the author shows that the cultivation of medicinal and officinal plants was the fundamental object kept steadily in view. But recognising that the modern botanic garden, while not departing from this original function, has developed other and equally important features, he has not confined himself exclusively to the pharmaceutical aspect of the London botanic gardens, but has given in a concise but comprehensive manner a review of the work accomplished by them in the domain of pure botany and in the application of the science to technical affairs. The subject has been treated throughout with a breadth of view, an insight and a sense of proportion which have too often been lacking in sketches of this nature, and the absence of which may be held accountable in a great measure for the vague ideas prevalent as to the functions of a botanic garden.

The gardens dealt with are the Chelsea Physic Garden, the Royal Botanic Gardens, Kew, the Royal Botanic Society's Garden, and the garden of the Royal Horticultural Society. The last makes no claim to rank as a botanical establishment, but in view of the close association with it of such men as Lindley, Bentham, and Fortune, and of the services rendered to botanical science by the collectors of the society, such as Don and Douglas, the author rightly feels that in a comprehensive review the Royal Horticultural Society cannot be ignored. In dealing with the three London botanic gardens proper, Mr. Perédès judiciously leaves the reader to form his own idea of their relative importance. Each is dealt with separately, from three points of view—historical, functional, and administrative.

From the historical standpoint it may almost be said that the history of these gardens is the history of systematic botany in England. In dealing with their functions, as already remarked, there has been no attempt at comparison. But the conclusion one arrives at is that, in inception at least, these respective botanic gardens were complementary rather than antagonistic or competitive. While founded on a common basis, they differed widely in scope, and though perhaps not dovetailing perfectly, there was no material overlapping. Thus the deed conveying the Chelsea Physic Garden to the Society of Apothecaries in 1722 stated that the conveyance was made "that their apprentices and others might better distinguish good and useful plants from those that bore resemblance to them, and yet were hurtful, and other the like good purposes."

The Royal Botanic Society was established, in 1839, on a somewhat wider footing "for the promotion of botany in all its branches, and its application to medicine, arts and manufactures, and also for the formation of extensive botanical and ornamental



Chelsea Physic Garden (*circa* 1850) from the river, before the construction of the Chelsea Embankment. From "London Botanic Gardens."

[1] "London Botanic Gardens." No. 62 of the Publications of the Wellcome Chemical Research Laboratories, Snow Hill, E.C. Pp. 99, with 31 plates.

gardens within the immediate vicinity of the metropolis." Both were strictly metropolitan institutions, and both were essentially educational establishments, differing only in scope. Various exigencies have at times modified, and even obscured, their primary object, but each has, so far as circumstances permitted, devoted itself to educational work. The extent and value of the services they have rendered, and continue to render, in this direction are fully detailed in the work under review.

Kew, on the other hand, can only be termed a *London* botanic garden in a strictly limited sense. As a national institution it has a much wider field, and its activities are on a correspondingly broader basis. Unlike the other gardens, it does practically no direct educational work, but "stands out prominently as a centre of botanical research, and as the cradle of botanical enterprise in India and the Colonies."

The principal aspects of Kew work are touched upon, but the limits of space have compelled the writer to treat them by way of illustration rather than exhaustively. No reference is made to the horticultural or ornamental side of Kew. While detracting in a measure from the completeness of the sketch, the omission is the less to be regretted because of the growing tendency on the part of the general public to regard this feature as fundamental rather than incidental, and to look upon botanic gardens as places of recreation rather than as scientific institutions. Mr. Perrédès's work, by directing attention to the conspicuous part that the London botanic gardens have played in the scientific and material progress of the nation, should go far towards removing the reproach that our botanic gardens are better understood and more appreciated abroad than at home, a reproach which gains point from the fact that the papers under notice were contributed to an American journal, and are only available in this country at second-hand.

The work is well illustrated, and contains a copious bibliography.

THE NATIONAL PHYSICAL LABORATORY.[1]

THE recent discussion of the affairs of the National Physical Laboratory in Parliament, and the appointment of a departmental committee of the Treasury to inquire into the working of the laboratory, with special reference to its alleged "competition with private establishments," have tended to produce amongst the newspaper-reading public an impression that the institution was not being carried on satisfactorily. It may be useful, therefore, to state in a few words what is really the position of affairs.

The laboratory was established in 1899 to serve as an independent testing authority, and to carry out researches into the properties of materials which, while necessary for the advance of the industries of the country on scientific lines, are generally too extensive and laborious to be undertaken by private individuals. It was not anticipated that it would ever be necessary to compete with the existing private institutions in the testing of materials, but nothing in the Royal Society's scheme on which the laboratory was founded limited its testing powers. Once it was equipped and staffed, the desire of industrial firms to have their materials tested by men who had already made names for themselves in the scientific world appears to have led to much work of this kind being sent to the laboratory, and it is difficult to see on what grounds it could be refused. Whether it is to be undertaken in future or not the Treasury Committee must decide.

With regard to the research work of the laboratory, there can be no two opinions. A glance through the two works under notice is sufficient to show how well it is fulfilling its task. Dr. Stanton's work on the resistance of iron and steel to reversals of stress is supplying information urgently needed, and with Dr. Carpenter's work on the structure of high-speed tool steel and on the properties of iron-nickel-manganese-carbon alloys is constituting the laboratory *the* authority in this country on the properties of the materials used by mechanical engineers. Mr. Paterson's investigations on light standards and glow lamps, communicated to the Institution of Electrical Engineers in January, supply gas and electrical engineers with information of the greatest value as to the relative merits, or rather demerits, of the various standards of light. Mr. Campbell's researches on the properties of the paper and cellulose used in telephone cables, on insulating materials suitable for high temperatures, and his hysteresis research, all bear intimately on the electrical engineering industry, as does Dr. Caspari's work on gutta-percha and balata. Dr. Harker's new bench-mark 1710° C. for the melting of platinum will serve as a starting point for a revision of all our high temperature melting points, and will introduce precision into a region in which uncertainty has been the prevailing feature. His interesting work on the Kew temperature scale may lead to Kew methods becoming international.

The testing work of the observatory department has increased, and the department appears now to turn out "hall-marked" men, *e.g.* Wood, Simpson, and Gold, as well as "hall-marked" instruments. Two important discussions, by Dr. Chree, of terrestrial magnetism and of atmospheric electricity records, and their relation to meteorological phenomena, show that there is no likelihood of the reputation of Kew as a place of research suffering now it has lost its independence.

The few investigations mentioned above serve as examples of the work that is being done in the laboratory, but they tell nothing of the good influences exerted by the laboratory through the members of its staff on the councils and at the meetings of scientific and technical societies throughout the kingdom.

Although there will always be members of the public, and even Members of Parliament, who are unable to understand why any of the nation's money should be invested outside the circle of "small profits and quick returns," no one who is anxious that our country should stand shoulder to shoulder with its neighbours in the march of scientific and industrial progress can feel other than gratified that in establishing the National Physical Laboratory we have taken a step in the right direction.

C. H. L.

[1] The National Physical Laboratory Report for the Year 1906. Pp. 61. (Teddington: Parrott and Ashfield, 1907.)
The National Physical Laboratory—Collected Researches, vol. ii. Pp. ii+310. (N.D.)

DR. EDWARD JOHN ROUTH, F.R.S.

BY the death of Dr. Routh on June 7, after a period of gradually failing health, a commanding figure in the recent history of English mathematics has been removed. Born at Quebec in 1831, the son of a distinguished British officer, he was educated in London at University College School, and subsequently studied mathematics under de Morgan at University College. He matriculated at Peterhouse in 1850, but did not drop his London connection, obtaining the gold medal in mathematics with the degree of Master of Arts in 1853, then a somewhat rare distinction. At Peterhouse he had Clerk Maxwell, who