NOTES.

THE OPENING OF THE NEW BOTANICAL DEPARTMENT AT THE GLASGOW UNIVERSITY.—On June 13, 1901, as a part of the celebrations on the ninth Jubilee of the University of Glasgow, the new Botanical Department was formally opened by Sir Joseph Hooker. The building has been erected after the design of Mr. J. O. Scott and Mr. J. Burnet, and has cost over £17,000. It includes a lecture-room to hold 250, elementary laboratory to seat 100, advanced laboratory, museum, herbarium, private rooms, dark rooms, &c.

Principal Story, in a speech acknowledging the benefactions from which the cost of the building had been met, referred to the hereditary connexion of Sir Joseph Hooker with Glasgow, his father having been for twenty years the Professor of Botany in that University, of which he himself is a graduate.

Sir Joseph Hooker's opening address was as follows:—

Ladies and Gentlemen,

My friend Professor Bower has done me the honour of asking me to perform the function of declaring these buildings open, and to preface it by giving my earliest recollections of the botanical teacher and his teaching in this University. To do this I must ask you to imagine yourselves carried back to the first quarter of the last century, a time so long gone by, that what I have to relate must be regarded rather as impressions retained than memories recalled.

My father was then the Professor of Botany, and to understand his position at the commencement of his career as such, I must give you an outline of his previous life as a botanist. He had not been educated for the medical, or indeed for any other learned profession. Having inherited ample means, and having been from childhood devoted to the study and collection of objects of natural history, he

determined to devote his life and his fortune to travel and scientific pursuits. Beginning with ornithology and entomology, he subsequently confined his attention to botany, and a few years after coming of age undertook a voyage to Iceland, where he made large collections with notes and observations. These were totally lost through the rapid destruction by fire, in mid ocean, of the ship in which he was making the return voyage to England. His life and those of the crew were saved through the fortuitous arrival of a vessel that should have left Iceland before them, but which had been providentially detained. On his return, he printed for private distribution his 'Journal of a Tour in Iceland,' which was shortly afterwards published in two volumes. This secured his election as a Fellow of the Royal Society at the early age of twenty-seven. Having been frustrated in his intention to visit Ceylon (for which he had completed his outfit) through disturbances in the island, and from going to Brazil or South Africa by the war with France, he turned his attention to Scotland, where he made three extended botanical tours, travelling in the Highlands on foot, on horseback, or by boat, as far as the Orkneys and Skye. He also spent nine months botanizing in France, Switzerland, and the North of Italy. In the intervals he devoted himself to the study of Cryptogamic plants, chiefly Mosses and Hepaticae, upon which Orders he published works that established his reputation as a systematic botanist.

Early in 1820, reduced circumstances requiring him to turn his botanical attainments to material account, he obtained, through the influence of his friend Sir Joseph Banks with George III, the chair of Regius Professor of Botany in this University. It was a bold venture for him to undertake so responsible an office, for he had never lectured, or even attended a course of lectures; and in Glasgow, as in all other Universities in the kingdom, the botanical chair was, and had always been, held by a graduate in medicine. Owing to these disqualifications his appointment was naturally unfavourably viewed by the medical faculty of the University. But he had resources that enabled him to overcome all obstacles: familiarity with his subject, devotion to its study, energy, eloquence, a commanding presence with urbanity of manners, and above all the art of making the student love the science he taught. Success attended the delivery of his first course, hastily as it had to be prepared, as was proved by his students presenting him, at the close of the course, with

a handsome silver vasculum chased with the design of a moss that had been named after him, in token of their appreciation of his lectures. So, too, at the end of his second, he received a similar recognition, in the shape of a beautifully bound early edition of Scott's poetical works in ten volumes.

But his energies were not confined to lecturing: feeling the want of a manual on the Scottish Flora to put into the students' hands, he published in time for use in his second course the *Flora Scotica* in two volumes, the outcome mainly of his earlier Scottish expeditions; and in readiness for his third course he produced at his own cost, and from drawings made by himself, an oblong folio of twenty-one lithographed plates, with descriptions of the organs, &c. of upwards of three hundred plants. A copy of this work was placed before every two students in the class during that portion of each day's lecture that was devoted to the analysis of plants obtained from the garden and placed in the students' hands for this purpose. I should mention that every student was expected to provide himself with a pocket-lens, knife, and pair of forceps, aided with which they followed the demonstrations of the Professor. I think it may fairly be said that these early lectures heralded the dawn of scientific botanical teaching in this University.

Another claim upon the Professor's energies was due to the fact that the botanical class was in a great measure ancillary to that of *materia medica*, a practical knowledge of which latter subject was at that time required of all candidates for a medical degree, diploma, or licence, by, I believe, all the examining bodies of the United Kingdom. Now the Glasgow students of botany were, with few exceptions, preparing themselves for the medical profession, and a considerable portion of them at that time looked forward to service in the army, navy, India and the Colonies, where they would be thrown on their own resources for ascertaining the quality of their drugs, which had either undergone a long voyage from England, or had to be replaced by such substitutes as the practitioner's knowledge of botany might enable him to discover. The Professor hence devoted much time to teaching the botanical characters of the principal medical and economic plants. To this end he made large coloured drawings of them in flower, fruit, &c., which were hung in the classroom when the Natural Orders to which they belonged were being demonstrated, and he passed round dried native specimens of them

taken from his herbarium, or living ones from the garden when they were to be had, together with samples of the drugs or other products which they yielded. I may add that this collection, which he presented to Kew, was the germ of the three museums of economic botany, the first ever established, that are such important features of the Royal Gardens.

It remains to allude to the class excursions, which have always been, and still happily are, a prominent feature of the botanical teaching in the Scottish Universities. Of these there were three: two, on Saturdays, were habitually to Campsie Glen and Bowling Bay respectively. The third, which was eagerly looked forward to by the most ardent of the students, took place at the end of June, during what was called the 'preaching week,' when the lecture-room was closed. It was to some good botanizing ground in the western Highlands. As many as thirty students have taken part in one of these larger excursions, each provided with as small a kit as possible—a vasculum, and apparatus for drying plants. They were often accompanied by students from Edinburgh, and sometimes by eminent botanists, British and foreign. In those days there were few inns in the western Highlands, and fewer coaches, and the roads were bad. On one of my father's first excursions to some mountains beyond the head of Loch Lomond he provided a marquee holding thirty persons, which was transported in a Dutch waggon by a Highland pony; and for supplies the party depended upon the flocks and fowls of the cottagers. On the first upon which I was taken as a boy, to Ben Lomond, there was no inn at Tarbet, and we all slept there in our clothes, on heather spread on the floor of a cottage. On another occasion when I was allowed to join the party (more for fishing than for botanizing) on an excursion to Killin, we walked the whole way from the head of Loch Lomond along the old military road made in the previous century by General Wade, eulogized in the well-known distich:

'If you'd seen these roads before they were made,
You'd have lift up your hands and blessed General Wade.'

If I were asked what I regarded as of most importance to the student in the manner of my father's teaching as sketched above, I would answer that it taught the art of exact observation and reasoning therefrom—a schooling of inestimable value for the medical man, and one that is given in no other profession, but which ought to come,

in this country as it does in Germany, early in the education of every child. I have met many of my father's pupils abroad, in India and the Colonies, who have told me that the botanical lectures gave them the first ideas they had ever entertained of there being a natural classification of the members of the vegetable kingdom. Then with regard to the results in a botanical point of view, the magnetism of the lecturer, and the interest of the subject, imbued many of his pupils with a love of science that proved permanent and fruitful. They made observations and collections for their quondam Professor in the temperate and tropical climates of both hemispheres, some of them throughout their lives, which have very largely contributed to a knowledge of the Flora and vegetable resources of the globe.

After twenty years of professorship my father retired, and undertook the directorship of the Royal Gardens, Kew. Since that period great changes have been introduced in the method of botanical teaching in all our Universities, due on the one hand to a vastly advanced comprehension of the structure of plants and of the functions of their organs, and on the other to a recognition of the fact that the study of the animal and vegetable kingdoms cannot be considered apart. Furthermore, chemistry, physics, and greatly improved microscopes are now necessary for the elucidation of the elementary problems of plant-life. The instruction in these two sciences (chemistry and physics) has, with all others, advanced in this University *pari passu* with that of botany, and kept it in the forefront of the educational establishments of the kingdom. The addition of the building in which we are assembled is evidence of the resolve that it shall not relax its efforts to maintain its well-earned position; and with the conviction that the Botanical Laboratory will prove an invaluable aid to research under the aegis of its distinguished Director, I now, under his authority, declare it open.

Sir Wm. Thiselton-Dyer, who also addressed the company, said this was a very remarkable occasion. He was not speaking merely of the opening of this splendid building, but of the memories which had been recalled in the celebration of the ninth jubilee of the University. There was one idea which had dominated the proceedings—namely, how great was the responsibility which fell on every one in an academic institution, who had to do with education. Lord Kelvin, in an eloquent speech made the previous night, told them that the past, the present, and the future were all one, that the present was the

heir of the past, and that the present was fraught with the responsibility of that which is to come. Now there were circumstances connected with the study of botany in this institution, which had been dwelt upon by his own distinguished predecessor in the institution over which he himself presided, which illustrated the never-ending responsibility of academic work; for if it had not been for the work of Sir Joseph Hooker's father in this University he did not think that Kew would be to-day what it is; and as the University of Glasgow looked to Bologna, so did Kew look to Glasgow. At the commencement of the reign of our late revered Sovereign it had been determined to make of the royal demesne a great scientific institution, and the Government turned to Glasgow and found in Sir Wm. Hooker a man who could administer and develop it. The reason they turned to Sir Wm. Hooker was because he had founded in this University a new and original school; and he carried the traditions of his work from Glasgow to Kew, where they had there been perpetuated. He was told that there were those who thought that this was too large a building to devote to so small a subject as botany. But what subject of interest did botany not touch? Darwin said: 'I love plants; they present all the secrets of life in their simplest form.' They found revealed in plants, in simpler form than could be observed in the animal economy, the inscrutable problem of life, and it was the study of these problems that would be pursued in this building. They had with them Lord Lister, and they knew the service he had rendered to humanity by curbing the lethal ends of obscure branches of the vegetable kingdom in their inroads on suffering humanity. In this great city, with its extensive commerce, there were problems absolutely immeasurable in the investigation of vegetable materials and in their application in the arts. It had been said that even the science of jurisprudence might be approached by the study of botany. The practical study of that science brought the student into immediate connexion with nature, and gave him the power of making accurate observations and drawing conclusions from what he had seen. Sir William concluded by congratulating Professor Bower and the University of Glasgow on the work he had done in connexion with the botanical department.

Lord Lister said it was a very great privilege to propose a vote of thanks to the veteran botanist of world-wide reputation—Sir Joseph Hooker. They rejoiced that the natural physical vigour which he exhibited so remarkably in his most wonderful and fruitful explora-

tions in the Himalayas still remained with him in his advanced years, and enabled him to do what he had done that day. He was sure they all hoped that Sir Joseph Hooker would long remain among them the principal pillar and ornament of botanical science in the world. They most cordially thanked him for the most interesting account he had given of his father's life and labours. It was certainly remarkable that one who began as he did should have been so exceedingly successful as a teacher. His Lordship had heard only yesterday from one of those present at this splendid jubilee that the attendance of students at Sir William Hooker's classes in this University was something phenomenal. He might, perhaps, be permitted, as one who in a very humble way loved botany—loved it dearly—to echo what had been expressed by Sir Joseph Hooker, and hope that the University of Glasgow and all Universities would never allow botany to be left out in the curriculum of medical study. He felt that the study of botany, when taught as it should be, introduced the young student in the most beautiful way to the study of biology, and it cultivated those habits of independent and accurate observation which were of such enormous importance, and which were apt to pass uncultivated in later medical study. Then, to echo what had been said by Sir Joseph Hooker and Sir William Thiselton-Dyer, one knew more and more that all life, whether animal or vegetable, was, so to speak, one; and with the great advance that had been made in late years in the knowledge of the vegetable kingdom, there could be observed and demonstrated with the utmost readiness many of the most important physiological truths and principles which applied to animals. It surely could not be a matter altogether of indifference to a medical man that he should be absolutely ignorant of the source of the vegetable articles of the *materia medica*. There might have been excess of attention devoted to this branch of medical study, but to neglect it absolutely seemed to him to be the most profound error. There were other subsidiary advantages from botanical study. If a man had not studied botany, how could he accept the post of analyst of an exploring expedition; how could he avail himself of the advantages he might have if he were placed as a medical man in some distant part of the world where there were objects all around him—vegetable as well as animal—well deserving his investigation and study? Lastly, he knew from experience that botany gave lifelong delight to the country. There were those who, when they went to the country, must have the excitement of sport

to give them interest in it; but the botanist, whether he made his rambles at home or abroad, was always sure of making new acquaintances in the vegetable kingdom or recognizing dearly-beloved old acquaintances. Therefore, from these various points of view, he ventured to express the earnest hope that botany would always be taught to the medical students of Glasgow University. Lord Lister concluded by proposing a vote of thanks to Sir Joseph Hooker for his address.

Professor Bayley Balfour seconded the motion. As a former Professor of Botany in this University, one who never dreamed of or aspired to these splendid halls for teaching botany, he warmly congratulated Professor Bower on having the energy, perseverance, and persuasiveness by which he had managed to secure so magnificent an equipment. It was most fitting that these halls should have been opened by one whose teaching had dominated botanical science for the past half-century, whose investigations had ranged over every field of botanical work, and whose influence upon the scientific thought of this country as a co-worker with Darwin was altogether immeasurable. Allusion had been made to the long connexion of the Hookers with Glasgow University. It was remarkable that a connexion, first formed so long ago as 1820, should at the beginning of this new century be strengthened by the opening of these halls by Sir Joseph Hooker. Under the imprimatur of no higher name in the world of science could Professor Bower enter on the work he had to do in these halls.

The proceedings then terminated.

SIMPLE APPARATUS FOR THE MEASUREMENT OF TRANSPIRATION FROM A SHOOT.—This modification of a well-known apparatus for the demonstration of transpiration from a shoot will be found useful in a laboratory, as it admits of a series of quantitative measurements in a short time and is easy to set up and adjust.

The bottle *A* is provided with a good rubber stopper pierced with three holes, one about 12 mm. in diameter, the other two about 5 mm. each; through one of the smaller holes the shoot is pushed, the other carries the gauge *B*, made of capillary tubing about 60 cm. long. Through the third larger hole passes a rod of wood terminating in a knob *C*; this serves to adjust the water to the zero position in

ERRATA.

Page 558, line 10. *For 'never' read 'had'*

„ „ *For 'or' read 'and'*

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