VALEDICTORY ADDRESS

TO THE

BOTANICAL SOCIETY OF EDINBURGH

DELIVERED IN NOVEMBER 1879

BY

THOMAS A. G. BALFOUR, M.D., F.R.C.P.E., F.R.S.E.

PRESIDENT

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PRESIDENT.

Gentlemen,—In resigning this chair, to which you did me the honour of electing me two years ago, I intend to deliver no formal address, but, as our obituary list during the past year has, I am sorry to say, been unusually large, to confine myself almost exclusively to giving a sketch of the lives of the deceased, especially as some of these have held the foremost ranks in botanical science. I cannot, however, omit taking some notice of a lecture delivered in this city about three weeks ago, in which botany as a part of medical education was virtually declared to be worse than useless. It would be preposterous in me, in addressing you, gentlemen, who know the value of that science so well, to occupy much time in replying to such a charge; but a few remarks seem called for on the present occasion.

I always thought that the grand feature of medical education in our day was the raising of its standard; and that the preliminary examinations recently introduced were for this very purpose, viz., to secure that no imperfectly educated person should find admission into the medical profession. On the same principle the wisdom of our fore-

fathers prescribed for the students of medicine the subjects of botany and zoology. The university, to its honour be it said, has maintained this programme in all its integrity; I regret, however, to say that the former subject has been ignored by the two colleges, but I certainly was not prepared to find that, not content with the colleges having dropped it, the university was to be attacked for having retained it, and that the very complete education which has been the glory of our *alma mater* was to be turned to her discredit. That botany may be studied as a part of general education was indeed conceded; but that, as regards its bearing on medicine it was (if the speaker's words were correctly reported) of no importance at all,—a mere waste of the medical student's precious time.

Now, gentlemen, such words as these, if uttered on any other occasion than that of an inaugural address, might safely be left to fall into the pit of oblivion, to which their inherent gravity would hasten their descent, but when we find other teachers present, and a vote of thanks unanimously accorded, it is time for us, in defence of our special science, to inquire whether or not botany can be of any use to the student of medicine; and I should say—

1st. He must surely have been asleep during the past few years who does not know and acknowledge the intimate connection between the vegetable and animal worlds. Physiology is, I suppose, regarded by the lecturer as an important part of the medical curriculum; but, I think, it must be generally allowed that no man can be a truly accomplished physiologist who is ignorant of the functions of the vegetable kingdom. So much is this the case, that only a few years ago, from that very same chair, Professor Pettigrew, in treating of the circulation of the blood, began with the consideration of the manifestation of movements in tubes, &c., as exhibited in the vegetable world, devoting at least two of his twelve lectures to that subject. It was one of the grand characteristics of the teaching of Goodsir, that he fixed the anatomical truths which he was communicating in a firm, interesting, and philosophical manner, by the analogous structures revealed by comparative anatomy; and surely no more certain method of conveying physiological truth in an attractive and impressive manner

can be found, than by taking a comprehensive view of the functions of organic life. But not to dwell longer upon this topic, I shall pass on to—

2d. That as a very large proportion of the substances of our Materia Medica are derived from the vegetable world, it is surely of importance that we should know something of the characters and relations of the plants which yield them. If any one should say that we can easily prescribe rhubarb without knowing its botanical source, or that it belongs to the *Polygonaceæ*, then I answer that we can with equal facility prescribe Epsom salts without any knowledge of its being sulphate of magnesia; but if the absence of the latter knowledge would imply an ignorance of chemistry which would preclude from the medical profession, on what ground can the gross ignorance of botany be applauded and regarded as a ground of congratulation? Is it asserted that an acquaintance with natural orders can teach us nothing bearing on the medicinal character of the plant? This only betokens the ignorance of the asserter; for does he not know that A. P. de Candolle, as early as 1816, published a work entitled "On the Medicinal Properties of Plants compared with their External Characters and their Natural Classification," thus establishing a law which indeed Linnæus himself suggested, and which was accepted by the majority of the men of science. The researches of Crum Brown and Fraser, Cahours, &c., on ethyl- and methyl-strychnia, have shown how a slight chemical change may entirely alter the physiological actions, and have thus proved how apparent contradictions to the above law, in the case of *Strychnos toxifera* yielding curare, as compared with other species of *Strychnos*, may be explained. But in a recent paper, Professor Herlandt, by a careful, minute, and discriminating process, has fully established the three following propositions:—

(1.) Botanic species and families which are similar in their characters are also similar in the nature and properties of their constituents.

(2.) The species which form the connecting link between similar groups contain constituents belonging to the allied families.

(3.) The botanic and natural classification of the medicaments of vegetable origin is the only scientific and rational one.

Any one who reads Herlandt's paper with care cannot fail to see that the suggestion of Linnæus was essentially correct; and surely that establishes the importance, if not necessity, of the study of botany by the student of medicine. It is not, however, only regarding medicinal plants that botanical knowledge is of service to a medical practitioner. I may illustrate this by a case that occurred in my own practice only a few months ago. A lady and gentleman entered my study, bringing with them their little girl, and exhibiting great anxiety and alarm lest she had poisoned herself, as she had eaten one of some foreign seeds which had been given her to play with. They had brought with them a seed similar to the one which she had eaten, and I was at once enabled to relieve their minds from all anxiety, and to assure them that no injurious consequences would result; for in the seed brought I recognised that of *Coix lachryma.* Now, supposing the child had been taken to the student or medical practitioner trained according to the most recent advice of the lecturer referred to, she would doubtless have been subjected to the misery resulting from the administration of an active emetic, and the grief and painful surmises of the parents would have remained unallayed. But to pass to the province of pathology, I assert—

3d. That even in tracing the history of some diseases, a knowledge of the lower forms of vegetation is of the utmost importance. Who that knows anything of the "germ-theory" is not aware of the fact that the *Bacteria* and *Vibriones* have, by Lister's able researches, been shown to be vegetable organisms?* Again, how is the medical practitioner ignorant of botany to be able to give an opinion as to the cryptogams which either cause or complicate so many diseases of the scalp? It is all very well to say

* Need I refer to the researches of Dr Klein in regard to what he styles "Pneumo-enteritis" in swine, by which he has shown "that the microphyte which accompanies the disease is botanically specific, and that both it and its progeny can be conducted through a series of artificial cultivations apart from the animal body; and that germs thus remotely descended from a first con-

you can get that information from botanists, but I regard everything connected with a disease as a special subject of medical study, to which the practitioner ought to be able to bring a mind well cultured as to phytology. It would be easy for me here to retort that insanity in most cases can without difficulty be proved by the testimony of the friends of the insane, and that, after all, the most skilful alienist physician would in many cases be very helpless without such testimony being afforded him; and that, as it is only the proofs of the existence and not *the kind* of the insanity which require to be scheduled, therefore the study of mental diseases in all their phases is only a needless burden imposed on the medical student who has an eye to general practice. But surely in such a case the reply would be forthcoming that we must train all our faculties and acquire all collateral knowledge, such as psychology, ontology, logic, and deontology, that we may intelligently deal with the disease; and is not a similar answer as valid regarding botany in the above instances.

4th. Were it only as a healthy recreation, botany is a great advantage to the medical student. The lecturer stated that he would select his assistant not from among the students who had obtained gold medals for herbaria, but from among those who could show most names in the dispensary case-book. Now, apart from the gross misrepresentation of botanical science and teaching which is involved in the above statement, it would probably be found that the diligence and energy displayed by the successful competitor for the herbarium medal had also procured for him the largest number of cases in his dispensary book, and these more carefully and accurately diagnosed, just in consequence of the botanical training through which he was passing; and as it is important that an assistant should be possessed of vigorous health, such a condition would be more likely to be found in the botanist than in the other. Besides all this, the physician who has no

tagium will, if living animals be inoculated with them, breed in these animals the specific disease." The splenic fever of farm stock has been proved by other observers to be due also to a microphyte; and the *Spirilla*, which is a distinct botanical species, though not actually proved to be the cause of relapsing fever, is yet found multiplying in the blood of persons affected with that disease (Simon).

interest in natural science studies is apt to have his mind cramped and narrowed, and is thus prepared to fall a victim to morbid ideas; whereas the man whose studies have embraced the natural sciences finds an ennobling and healthy influence in their pursuit. How different from that of the lecturer referred to was the view of such a physician as the late Dr Warburton Begbie, who, on receiving a botanical paper from a medical friend who had written it, expressed the interest which he felt in the subject, and added, "How pleasant it is to have such a study to relieve the tension of your ordinary daily labours." The keen student of botany is not necessarily the less ardent and successful prosecutor of his other medical studies; though, to confine myself to my own fellow students, neither Burdon Sanderson nor Murchison, however they might have aspired, would ever have been admitted to the high office of assistant to Dr Batty Tuke.

It would be easy to enlarge on this theme, and to show the importance of a knowledge of botany from its bearing on hygiene,—*e.g.*, when vegetable organisms in the water-supply render it unsuitable,—malaria,* &c., &c.; but the time at my disposal is already too short for the work that is before us, so that I must at once proceed to the Obituary Notices, which have reference to the following:—

Mr JAMES M'NAB.
Sir W. C. TREVELYAN.
Dr M'BAIN.
Prof. GRISEBACH.
Mr ARTHUR FORBES.
Mr A. J. ADIE.
Dr JAS. CUMMING.
Dr KARL KOCH.
Dr CHARLES MURCHISON.
Dr DAVID MOORE.
Mr PETER S. ROBERTSON.
Mr WM. MUDD.
Dr JOHANN F. TH. IRMISCH.
Mr SAMUEL HAY.
Dr M. A. E. WILKINSON.
Rev. W. B. CUNNINGHAM.
Mr E. V. SANDILANDS.
Mr A. GRAHAM.

* Since the above was written, a most interesting essay on "Contagion," from the pen of Mr Simon, has appeared, in which he quotes the researches of Professors Klebs and Tommasi-Crudeli made at Rome in reference to the ague endemic there, which seem to render it certain that ague-poison is a microphyte of malarious soil; for these professors maintain that they can isolate from malarious soils and their atmospheres definite microphytic forms capable of separate cultivation; and that if this microphyte, which they have named *Bacillus malariæ*, be cultivated through successive generations in successive portions of an indifferent fluid, and a portion of the last fluid in which the *Bacillus* is germinating be injected subcutaneously into rabbits, ague will be produced in these animals.

In my opening address last year I alluded to the deep sorrow which we all felt at the serious illness under which Mr M'Nab was labouring, and I then expressed the earnest hope that his valuable life might yet be prolonged for our sakes, and for that of the science which he loved so well. It has, however, been otherwise ordered, and we have been called to mourn over his sad removal from among us, which has left a blank of no ordinary kind. A special obituary notice of our late esteemed Curator was, as was most befitting, communicated to us during our last session by the Regius Director of the Botanic Garden; but I should think myself chargeable with unkindness and neglect did I, in my present position, even at the risk of repetition, omit all reference to some of the valuable services which he rendered to botanical science, especially to horticulture. As one of the original members of this Society, which was founded in 1836, he was most diligent and assiduous in his attendance, and contributed largely to its "Transactions." A touching incident occurred only a few days before his death, which shows the great interest which, to the very last, he took in this Society, and the conscientious way in which he discharged his duties towards it. One day, when seriously ill and naturally claiming the constant attention of his attached family, none of whom was willing to be absent from him, he remembered that in the evening our opening meeting for the session took place, and turning to his son, he urged him to go to it as his representative; "for," he added, "I have never, till now, been absent from any of the opening addresses." It was always a treat to listen to the very interesting monthly reports on the progress of open-air vegetation in the Botanic Garden, and the various readings of the thermometer, which have proved of the highest value to horticulturists and meteorologists; in connection with the latter, I need only remind you of the very interesting paper by our friend Mr Buchan, "On the Flowering of Spring Plants," and to his acknowledgement of his indebtedness to those observations of Mr M'Nab. To all the cognate subjects of botany, horticulture, arboriculture, landscape gardening, and vegetable climatology he devoted much attention, as his numerous papers scattered through various magazines show; and many a piece of

ground, whether it be a square or park in the city, or more extensive domain elsewhere, owes its beauty and attractiveness to the skill and ability of his directing mind.

The Rockery in the Botanic Garden will ever be associated with his name. It has proved a great success, and has added an additional charm to these Gardens which, though dealt with most niggardly by successive Governments, stands second to none but Kew. In 1872 Mr M'Nab was unanimously elected to occupy this presidential chair, and the admirable opening address which in November 1873, in the capacity of President, he delivered, and the animated discussion to which it gave rise, are fresh in the memories of all of us.

I have not alluded to the special advantages which Mr James M'Nab enjoyed in being trained under so distinguished a father, who, for the period of thirty-eight years preceded him as Curator, nor to his own appointment, in 1843, to that honourable and responsible position, which he filled with such credit to himself and benefit to the Gardens; nor have I spoken of his visit in 1834 to the United States and Canada, which he turned to such good account; nor have I alluded to his experiments on the best method of heating greenhouses; nor to his appointment as Superintendent of the Experimental Garden; for we have already had such a full history of the life and work of our departed friend, that only a few words seemed here to be necessary. From my own personal experience, however, I cannot refrain from adding that I always found in Mr M'Nab the greatest willingness to oblige, and readiness to facilitate the carrying out of any experimental researches. And I cannot help saying that, since we have been deprived of his valuable services, it is a matter of no small congratulation that in his successor we have one who enjoyed such constant intercourse with him, and knew his views so well, and who cherishes a warm regard for his memory, and is anxious to carry out the schemes which were so well devised by his predecessor, but which the hand of death prevented him from accomplishing.

Sir Walter Calverley Trevelyan, Bart., died suddenly at Wallington, his seat in Northumberland, on March 23,

1879, in the eighty-second year of his age. He early displayed a strong love of science, for, even when a boy at Harrow, he would rise early in the summer mornings and go great distances in quest of plants, which often necessitated his beating a hasty retreat, that he might be present at prayers at eight o'clock. After leaving Harrow he went to Oxford, and attended the University College, where he was a student in the botanical and geological classes, and took his degree of M.A. in 1820. He then came to Edinburgh to prosecute still further his scientific studies. He lost no time in practically applying the scientific knowledge thus acquired, for in 1821 he visited the Faroe Islands on a botanical and mineralogical expedition, where he spent some time, and proved himself to be a most close, careful, and accurate observer. He read a paper on the "Vegetation and Temperature of the Faroe Islands" in the Natural History Section of the British Association at Edinburgh, in 1834, and published it in a somewhat extended form in vol. xviii. of the "New Philosophical Journal." This article is very interesting and instructive, giving as it does a brief sketch of the appearance of some of the mountains and their elevations, of the kind of soil which generally prevails, of the climate, which is for the most part mild but damp, and of the temperature which, at Morshavn at least, was found to have a mean of 45·399°.

He gives a list of some of the plants found on July 18, 1821, on the south-east side of the mountain, Mallingsfiall, in the Island of Videroe, and here the careful manner in which he made his observations is shown by such remarks as the following:—At 1088 feet, *Salix herbacea* (first plant); at 1098 feet, *Prunella vulgaris* (last plant); at 1382 feet, *Dryas octopetala* (one plant only), but at 1530 feet, it was frequent. One plant only of *Papaver nudicaule* appeared at 1530 feet, but it was of frequent occurrence at 1950 feet; and so on. Here the mention of the particular side of the mountain examined, the date of collecting, the different altitudes at which particular plants first appear and become frequent, &c., prove him to have been at that early period an accurate observer.

He succeeded his father as Sixth Baronet, on May 23, 1846, and greatly improved his extensive landed estates,

both at Wallington, in Northumberland, and at Nettlecombe, in Somersetshire. He was a Fellow of the Royal Horticultural Society, which his father had founded; and was also one of the Trustees of the Royal Geographical Society. He did much to advance geology in the comparative infancy of that science, and contributed many papers on that subject to the "Transactions of the Wernerian Society," which were characterised by much skill and ability; and the care with which they were executed is evident from this consideration, that most of, if not all, the facts adduced by him have been confirmed by subsequent investigators. In the last paper on the rocks of Northumberland, published by Messrs Topley & Lebour, the following complimentary reference to Sir Walter occurs: "The earliest paper claiming special notice regarding the intrusive nature of the whin sill of Northumberland was one published by Sir Walter Trevelyan in 1823, in which a careful account is given of the geology of part of the northern coasts of Northumberland; a map and section accompany the paper, showing how unevenly and irregularly the basalt lies among the strata in that district. The limestone lying upon the whinstone is described as being very crystalline towards and at the point of contact." Twelve or more other papers on scientific subjects issued from his pen. But, not only was he ardently attached to science, he was also a lover of literature. He had a refined mind, and was possessed of extensive knowledge. When the Rev. Mr Hodgson was writing his "History of Northumberland," he was much indebted to the subject of our sketch for valuable aid, and the third volume of the "Camden Society's Trevelyan Papers" was edited by him conjointly with his cousin, Sir Charles Trevelyan. He was of a kind and liberal disposition, and hence many museums were recipients of his bounty. To the New Museum in University College, Oxford, he gave largely; but his contributions also extended to the British Museum, and the Museum at Kew, to which he presented his Faroe Island Herbarium and other collections. Several of the specimens collected in these islands were also given to our museum; and in May 1867 we have in our "Proceedings" a notice to the following effect: "Sir W. C. Trevelyan presented a large collection of British, Continental, and

Australian dried plants." For some botanical works in our library we are also indebted to him.

Sir Walter entered heartily into whatever measures he considered likely to promote the wellbeing of society; hence the deep interest which he took in education, and the earnest and persistent efforts which, both by precept and example, he employed to suppress the vice of intemperance; of which efforts the United Kingdom Alliance showed their thorough appreciation by electing him their first president in 1853, and retaining him in that position till he was removed by death.

He was a Non-Resident Fellow of our Society, and his name has been perpetuated in science by being associated with one of the most elegant of all the minute *Gastromysi*, the *Leangium Trevelyani* (Greville).

In Dr James M'Bain science in many of its departments has lost a most able and successful cultivator, and many of us a warm and attached friend, whose absence from our Society, of which he was a Resident Fellow, we sincerely mourn. Dr M'Bain was born at Logie, in the parish of Kirriemuir, Forfarshire, on November 30, 1807.

He began his medical studies in this city in 1823, and passed his examination at the College of Surgeons in March 1826, thus receiving his diploma from that body when little more than nineteen years of age. In the same year he also took the degree of M.D. at the University of St Andrews. In the following year (1827) he passed his examination for assistant-surgeon in the Royal Navy. Not long afterwards he was appointed to H.M.S. "Undaunted," then commissioned at Chatham to take out Lord William Bentinck as Governor-General of India; he served several years, employing his spare time in natural history pursuits. In 1832 he was appointed assistant-surgeon to H.M.S. "Investigator," which was then employed under Captain George Thomas in surveying the Shetland and Orkney Islands. Here M'Bain had his scientific tastes largely gratified, as he carried on dredging along the coast, as well as in deep water, and there accumulated a large amount of material which was afterwards utilised in Forbes' and Hanley's "Mollusca." He also here made fine collections

of marine algæ for Dr Harvey's famous work, "Phycologia Britannica." In 1848 the vessel was paid off, and Dr M'Bain returned to *terra firma*, and took up his residence at Elie for four years, before fixing his abode at Trinity. About this time (1853) he became an attendant at our meetings, and continued to be so pretty constantly till his last illness. When he came to Trinity he met in Professor Fleming (who was a relative of his) with a man of a like type with himself—honest, sincere, original, steadily prosecuting science for its own sake, without any view to ulterior advantages, and for him he ever entertained the warmest regard. To geology his thoughts seem to have been specially directed by that very able and accomplished professor, and the cognate science of mineralogy was to him a source of delight. He latterly devoted himself also to anthropological studies, and with his friend Professor Turner was busily engaged in measuring crania, &c. In his many scientific excursions, his vasculum and his geological hammer were his constant companions. In short, it may be truly said of M'Bain, that within his heart were chords which vibrated in unison with Nature in her various domains. When Professor John Fleming was removed by death, Dr M'Bain, who during his life had proved his *fidus Achates*, took his place and maintained his teachings, specially in zoology and geology, at the meetings of our sister Society, "The Royal Physical," where he was no less respected than among ourselves. His generous nature led him ever to encourage any sincere investigator of scientific truth, and his kindly sympathy with his fellow-labourers cheered them in the farther prosecution of their task.

But I should fail in my sketch if I did not view Dr M'Bain in his capacity of faithful custodier of that *Actinea Mesembryanthemum* who, among naturalists, has long borne the honourable appellation of "Granny," and who, though she has entered on her fifty-second, if not her fifty-ninth, year of existence, has not yet ceased to people the waters with her progeny, for, from the 4th March to the 4th of October of this year, on which occasion the last official registry of birth occurs, she has given birth to twenty-seven young ones. This is nothing, however, to her prolific powers in 1857, for then in a single night she gave birth

to no less than 240 young, which would have put Priam himself to shame, seriously alarmed Malthus, and taxed the energies of all the accoucheurs in Edinburgh and its surrounding districts. She was gathered from the rocks at North Berwick by Sir John Dalzell, and at his death was handed over to Professor John Fleming, then to Dr M'Bain, who, in prospect of his death, was most solicitous to find a proper guardian for such a treasure. Some to whom he spoke declined to undertake so responsible a duty, till, at last, our excellent friend Mr Sadler was asked and cordially responded to the request, and on March 1st of this year the old lady was duly handed over to his care by Dr M'Bain, and, as most of us know, she receives that kind attention and tender regard to which her years and history entitle her. This last fact regarding our departed friend serves to show the unabated interest which even to the end he took in objects of natural history.

He died at Logie Villa, Trinity, on March 24, 1879.

August Heinrich Rudolph Grisebach was born at Hanover, on the 17th of April 1814, and died on the 9th of May 1879. At a very early period in life he manifested a great love of botany; and an incident is recorded regarding him, when only twelve years of age, which shows at once his ardour and decision of character which enabled him to overcome difficulties that would have arrested the progress of any ordinary boy. He had himself no insignificant collection of plants, for in his botanical excursions he had explored very completely the neighbourhood of Hanover; but so anxious was he to obtain a more extensive supply, that he even summoned the courage to write to Professor Sprengel at Halle, requesting the professor to exchange plants with him; which request, I need not add, was kindly and generously responded to by Sprengel.

At fifteen he was sent to school at Ilfeld, where he remained two years. Here, also, he fully availed himself of the large opportunities which the surrounding country afforded him for his botanical studies.

In 1832, at the age of eighteen, he entered the University of Göttingen, and continued to study there till 1835. His principal teachers were Schrader and Bartling, and

among his fellow-students was one who has most deservedly risen to the highest honour, viz., to the Chancellorship of the German Empire, I refer, of course, to Prince Bismarck, and it is much to the credit of the Prince that he did not allow his high position to affect in any way the true friendship of their youthful days.

From 1835 to 1837 Grisebach attended the University of Berlin, where his chief teachers were Kunth and Meyen; the latter especially captivated him while he expounded vegetable physiology. Among his fellow-students here were Schleiden, the famous author of the "Cellular Theory of Plant Structure," and Schwann, the no less famous applier of that theory to the animal organism. With the former of these Grisebach had frequent and close intercourse, while Schwann was also among the circle of his friends, and for some time lived in the same house with him. In 1836 he took his degree of Doctor of Medicine in that University; and in the autumn of 1837, in consequence of the death of his father, he removed to Göttingen, and started as a lecturer.

In 1841 Grisebach was chosen Professor Extraordinary of Botany in the University of Göttingen. In 1844 he pursued the sensible course of entering into a matrimonial alliance with Miss Evelina Reinbold, daughter of the chief constable of the King of Hanover, and as the fruit of this marriage there were two sons. He was appointed to the chair of Ordinary Professor in the same university in 1847.

In this university he took the deepest interest, and he gave practical proof of his sincere attachment to it by refusing a call, in 1846, to become Ordinary Professor of Botany at Giessen, at a time when the renown of Liebig was attracting students from all parts of the world to that university. He also refused two invitations which came to him simultaneously, in 1851, from Leipzig and Berlin respectively. In 1855 he likewise refused two other applications to accept a professorial chair at Munich and at St Petersburg; while, in 1866, a second invitation reached him from Leipzig, which he also declined. Notwithstanding his high intellectual ability and great fame, Grisebach was a man of true humility, which in his case amounted even to shyness; he was specially amiable, and

a steadfast friend. As has been well said of him, "his character was harmonious in an unwonted degree."

His great work, which is indeed of very high merit, is his "Vegetation of the Earth according to its Climatological Distribution: a Sketch of the Comparative Geography of Plants," in 2 vols., published at Leipzig in 1872. For the production of such a work the course which would naturally commend itself as likely to be the most efficient, would be to allot to several authors, famed for scientific ability, and inhabiting the different regions of the globe, the botany of that particular part where the lot of each might be cast, and thus by the combination of these a work in some degree equal to the occasion might be expected. But failing this series, probably no *one* author could have been found who could have done more justice to such a subject than Professor Grisebach. His mind, which was of a very high order, had been continuously directed to this subject for many years. His first impressions regarding the relation of a Flora to the soil and climate were received when he was little more than fifteen years of age, amongst the varied vegetation of the Hartz district; and, while still a student at Göttingen University, Grisebach contributed to the periodical called "Flora" an account of a Botanical Journey to Dauphiné and Provence, which he had made in the autumn of 1833. The same special tendency is shown in his article, "On the Influence of Climate on the Limitation of the Natural Flora," which he published in the "Linnæa," in 1838. Indeed, in 1837, or thirty-five years before the appearance of the work, the plan which he intended to pursue in it had been laid down in a small handbook. In 1839 he was appointed by the Hanoverian Government to undertake a scientific journey to Turkey, which he accomplished; and on his return he published an account of this "Journey through Roumelia and to Brussa," in 2 vols., in 1841; a work of great value and of deepest interest to the botanist; and this was followed in 1843–5 by another work of 2 volumes, entitled "Spicilegium Floræ Rumelicæ." After his return in 1841, however, he also began that regular series of articles which kept him in a special manner *au courant* for his "Vegetation of the Earth." I refer, of course, to his Annual Reports

on Botanical Geography, which appeared in the year 1840 in "Wiegmann's Archiv." for 1841, and which were regularly continued in the same periodical till 1853 inclusive, from which time an interruption occurred till 1872, when they were resumed, and three notices up to 1876 appeared in Behm's "Geographical Year-Book." In 1844 he wrote "On the Character of the Vegetation of Hardangen in Bergen," in connection with his visit to Norway in 1842, which was rich in its yield to botanical geography, and which led to a lively epistolary correspondence between him and Alexander von Humboldt. We find him again, in 1847, writing "On the Lines of Vegetation in the North-West of Germany"; and five years afterwards (in 1852), "A Commentary on the Geographical Distribution through Europe of the Genus *Hieracium*," and in that year, along with Schenk, who had been his fellow-traveller, he published "Certain Observations on Plants collected from the year 1851 on an Alpine Journey"; and also an account of a "Hungarian Journey undertaken in 1852," with the same companion; and "Contributions to the Systematic Arrangement of the Flora of Hungary." This last appeared in "Wiegmann's Archiv." for 1862. With Schenk he also visited the Pyrenees in 1853. In the following year, in the Göttingen Reports there appeared "Systematic Remarks on the Collection of Plants by Philippi and Sechler in the South of Chili and at the Straits of Magellan"; and in 1857, "Systematic Remarks on the Vegetation of some Islands in the Carribean Sea, especially of the Island of Guadaloupe, after the Collection of Ducharssaing." "Novelties of the Flora of Panama" was published by him in the following year; while in 1860, from the same prolific pen, appeared "Select Illustrations of the Plants of Tropical America." In 1864 he published a "Flora of the British West Indian Islands," with which, at the request of our Government, he had been engaged since 1857, during which period he had six times visited this country in connection with the publication, which he himself regarded as one of great importance; the relative Herbaria were also sent to him, and it is a fact of some interest to us to know that the names now attached to many of the West Indian plants in the Botanical Garden are owing to the

authoritative opinion expressed regarding them by Professor Grisebach. In 1866 he brought out "The Geographical Distribution of West Indian Plants." 1866 saw the publication by him of "The Vegetation Regions of the Earth clearly arranged." A paper "On the Grasses of High Asia" appeared from his pen in 1868. Besides the above, he wrote many other articles more or less closely connected with phytogeography, as, *e.g.*, some of the plants of Surinam, in Dutch Guiana. In 1849 he furnished the articles on "Malpighiaceæ and Gentianaceæ" in Klotsch's "Contributions to the Flora of the Æquinoctial Regions of the New World." Ten years previously (1839) he had written on the "Malpighiads of Brazil"; and along with Oersted, in 1853, he wrote on the "Malpighiads of Central America, with Notes on *Coutubea volubilis*, Mart., and some other Gentians of Tropical America." To the Gentians he had long had his attention directed, for we find him carefully studying that family while a student at Berlin, and he brought out his monograph on the subject shortly after his return to Göttingen; and in the "Annals of Natural History" for 1838 he is found associated with Hooker in a paper on the "*Gentiana scilloides*," Linn. fils., with some remarks on the genus. In 1843 he first published his "*Gentianeæ*," and in 1853, "*Schenkia*" (so called after his friend), a new genus of *Gentianaceæ*. From time to time he also furnished reports on the progress of systematic botany. Many other writings from this fertile mind could be adduced, but enough has surely been brought under your notice to prove that with such rare and superlative qualifications Grisebach stood out as preeminently the man who could do justice to such an *opus magnum* as ~~the~~ "Die Vegetation der Erde," and accordingly we find this publication occupying the very foremost place, being indeed the only comprehensive work on that subject. After its appearance, as already stated, in 1872, Grisebach was not inactive, but continued, as above indicated, his "Phytogeographical Reports." In his great work he divides the earth into twenty-four regions of vegetation, depending on physical and climatological considerations; and of this arrangement Bentham has thus expressed himself: "A closer examination of his regions shows them to

be much better conceived, in a phytoclimatic point of view, than I had at first thought them to be, when regarded as phytogeographical regions;" and again: "the data he has collected and methodised will be found to be an important contribution to the scientific study of geographical distribution;" and yet again: "the undoubted influence of climatological and other physical conditions on the progress, dispersion, and life-history of species is here worked out with a care and detail deserving the attention of all physiologists, as well as of all cultivators of exotic plants." Such a testimony borne by so high an authority cannot fail to have its due weight with you, especially when we remember the Darwinian proclivities of Bentham, to which system Grisebach was a very strong and decided opponent, regarding it, as he did, as a doctrine of transmutation. Even in its most moderate application Darwinianism found in him an uncompromising foe. He was too close an observer of nature, too rigid in his method of induction, and too just and accurate in his reasoning, to have any sympathy with those speculators who, when such a desperate course is regarded as necessary for the support of their rash hypotheses, do not scruple to shuffle and toss about continents as a man would a pack of cards; and who pride themselves on the happy allusions to the existing tropical Fauna and Flora as "the monuments of the departed continents, Atlantis and Limuria." But it is time enough to speak of a monument when we are assured that death has actually taken place, and it is time to inquire into the fact of the death when we have made sure of the previous objective existence. Now the soundings of the "Challenger" in the various oceans through which it cruised have thoroughly disproved any such existing objects as the above, and have shown that the assumption of their existence is "but the baseless fabric of a vision"; while Grisebach's science and philosophy are thus seen to accord with the latest discoveries of science.

The attention of Grisebach was specially directed to the territory of La Plata, of the botany of which little was known till it was explored by Lorentz and Hieronymus. In acknowledgement of the services rendered by Dr Lorentz, Grisebach's first work on the botany of this territory was

styled "Plantæ Lorentzianæ," and appeared in 1874, which was followed this year (1879) by another treatise, "Symbolæ ad Floram Argentinam." This treatise on the plants of the Argentine Republic was founded "on the collection prepared through the influence of the Government at Buenos Ayres, by Professors Lorentz and Hieronymus, as well as on the Herbaria of other naturalists preserved in the Museum at Göttingen." A short but interesting criticism of these works appears in the "Botanische Zeitung" of the 1st of August 1879, where any one can examine the differences between them, and the mode in which the variation in the number of species can be explained. In the "Symbolæ" five entirely new genera have been added,—viz., *Dermatophyllum*, *Cascaronia*, *Garaguandra*, *Dynoseris*, and *Halochloa*,—belonging respectively to the natural orders, *Zygophyllaceæ*, *Leguminosæ*, *Terebinthaceæ*, *Mutisiaceæ*, and *Gramineæ*. It was never Grisebach's intention to write a complete Flora of this district, but rather to give new genera and species, so far critical cases; but on both occasions there was a short but very significant general view of botanico-geographical species which is one of the most important parts of the treatise.

Yet another work was in contemplation by this indefatigable author, viz., a Flora of all Europe, and was already progressing under his diligent hand, for he thought he had a call to prepare such a work, as he had a personal intimate acquaintance with most of the European regions of vegetation, and as he possessed an unusually complete herbarium, seeing that scarcely any really European species were wanting in it. While thus engaged his April holidays arrived, which he spent most pleasantly with his family in visiting Rome and Upper Italy, but through the peculiar inclemency of the weather this year he caught a cold which gradually increased in severity, and closed his earthly career in the sixty-sixth year of his age. The deepest sorrow pervaded all Göttingen when the sad news was communicated there. By this mournful event a heavy blow has been inflicted on botanical science, for Grisebach was assuredly its ornament and boast. We specially deplore the loss which our Society has sustained, for he was one of our esteemed Honorary Fellows. His

able works and the genus *Grisebachia* will keep alive his memory in the minds of botanists.

In Arthur Forbes, the ninth laird of Culloden, our Society has lost a very able Non-Resident Fellow, and one of the most worthy and amiable of men. I only once had the pleasure of meeting him, and was deeply impressed with his kindly and genial nature, his high Christian character, and that genuine humility which shed a softened lustre over all his other excellences. He was the representative of a very old branch of the family of Lord Forbes, that namely of Tolquhon, which was noted for its wealth and power. One of the cadets, Duncan Forbes, went to Inverness in the beginning of the seventeenth century, where he became influential in the burgh, and was chosen Provost—a portrait of him in that capacity adorning the Town Hall. He was also the Parliamentary representative of the district. He purchased the estate of Culloden in 1625, to which Ferintosh and other properties were afterwards added. In the eighteenth century the far-famed Lord President of the Court of Session, who occupied that dignified post from 1737 to 1747, threw a halo of renown around the Culloden family, but it has been well and truly remarked that—"of all who preceded and succeeded him it may well be said of the late Arthur Forbes, that none led a more unblemished life or was more anxious to do well whatever duty his position imposed on him." He was born at Douglas, Isle of Man, on January 25, 1819, and was educated at the Universities of Aberdeen and Trinity College, Cambridge. One who knew him well has said of him that in early life he exhibited a decided taste for scientific pursuits, and ever after was a very close and accurate observer. Even in his common-place walks nothing escaped him. Natural history was perhaps his first study, and for years he kept up a naturalist's calendar. Botany was also early prosecuted, and during many a ramble he collected a rich and interesting herbarium of plants found in the district, and among rare specimens were *Goodyera repens** and *Pinguicula alpina*. To the last he took a great interest in both these

* Rare in other districts, though not in pine forests of the north.

sciences. But it was in meteorology and astronomy that he took the deepest interest, and on which he bestowed most labour. He was most faithful and diligent in discharging all the duties that he undertook, and hence as a country gentleman he was pointed and regular in his attendance at county meetings. As chairman of the School Board he was never absent from a meeting when at home, and so, as we might expect, the meteorological observations at Culloden were carried on by him without a single day's interruption from 1841 down to the month of March of the present year. It was by the advice of the late Sir David Brewster and Professor James D. Forbes that his attention was first specially drawn to these studies. The observations taken by Mr Forbes during that long period with such remarkable accuracy, are of great value, and the results when published, which will shortly be the case, will possess more than ordinary interest, establishing as they do many important and interesting facts relating not only to the climate but also to the changes of seasons in the northern parts of Scotland. He was a member of the Meteorological Societies of Scotland and London, and contributed from time to time many results of the more valuable and important of his observations to these societies as well as to the Royal Observatory at Greenwich. The researches connected with the British Rain-fall, so long and so ably conducted by Mr Symons of London, also received the benefit of his results. He was likewise fond of antiquarian pursuits, and took a deep interest in Druidical Circles; he also determined one of the Pictish marches to have crossed from the Moray Firth to Drummossie. He carefully preserved all relics of Culloden, and the portion of the battlefield where the Highlanders were buried is left unplanted and enclosed.

He was most persevering in whatever he undertook, and generally succeeded in accomplishing his object. A most striking instance of this has been supplied to me by another friend of his, viz., that after he was advanced in years he began the study of the Gaelic language, and acquired such an excellent knowledge of it that he was able to read and speak it fluently—a fact full of encouragement to the enthusiastic founder of our Celtic Chair. Nor did he

neglect the fine arts, for he took great delight in music and, when other engagements permitted, he devoted considerable attention to it. He had a particularly fine and accurate ear, and was able to note down from memory any piece which struck him, on having merely once heard it played.

As a man of business he was prompt in action, but also most kindly and generous. He was a very liberal landlord, who made the interests of the tenants his own, and was always most unwilling to part with them. When the rights of the people were acknowledged by the abolition of Patronage a few years ago Mr Forbes asked for no compensation from the parishioners. He took a deep interest in education and was the chief agent in securing its highly satisfactory condition in that district, and he most generously presented to the School Board the handsome building which he had erected at his own expense. But did I make no allusion to his religious character I should be ignoring the very foundation on which all his excellences rested, and the source from which those most estimable features of his daily life sprang. The gentleness, amiability, shrinking modesty, and warm-hearted philanthropy were no signs of weakness in the case of Mr Forbes, but were conjoined with a firm grasp and unflinching maintenance of the truth of God; and, while many in our day regard the attitude of doubting as the one befitting the student of nature and of God's Word, to the well-regulated mind of Arthur Forbes such an attitude indicated only weakness and imperfect enlightenment, while he himself rose far above those pestilential swamps, and soared in the clear, bright, and healthy region into which a living and assured faith in God's Word had introduced him. I conclude this sketch in the language of the friend above referred to: "It may truly be said of him that in all relations of life he was loved and esteemed, and few have been more sincerely mourned. He died suddenly at Aldershot on the 16th of March of this year, trusting alone in that Saviour whom he had all his life long loved and sought to serve."

Alexander James Adie was the son of the late Mr Adie of Edinburgh, a well-known optician, and was born

on December 16, 1808. From a very early period of his life he showed a strong liking for birds and animals of all kinds. This propensity developed itself more and more as he grew older, and became at last a marked feature in his character. He was educated at the High School, while in his own home he met with every encouragement in his studies, and even his leisure time was expected to be improved in prosecuting some useful and healthy pursuit. After completing his course at the High School he studied at the University here. He subsequently became a pupil of the late Mr Jardine, C.E., with whom he continued a considerable time, and was sent by him to various parts of Scotland on engineering work. To such a mind as his, early imbued with a love of nature, it can easily be imagined how the opportunities so abundantly afforded him, in this and the subsequent periods of his professional career, were fully taken advantage of by him for cultivating his taste for landscape gardening, and extending his knowledge of all kinds of trees and plants. A short time after leaving Mr Jardine he commenced on his own account, and accepted an appointment in the spring of 1838 as resident engineer to the Bolton and Preston Railway, a new line, the works of which were executed entirely under his superintendence. When these were completed he left Lancashire in 1844 and returned to Scotland; and in the following year, or about that time, was connected first with the Monkland Railways, and soon afterwards with the Edinburgh and Glasgow Railway. This latter connection lasted for many years, during which he had much parliamentary work, which brought him into contact with all the leading engineers of the day. He was, however, engaged in many other engineering works besides railways.

He was early made a Fellow of the Royal Society of Edinburgh, and though, in consequence of his residence being out of town, he could not for many years attend its meetings, he always took a deep interest in scientific subjects.

He was one of our Resident Fellows, and though for the same reason as that above mentioned he was not a frequent visitor at our meetings, yet for the last thirty years of his life it was his special delight to collect within his own

garden, at Rockville, near Linlithgow (which was entirely laid out by himself), all kinds of trees, shrubs, and flowers at all fitted to the situation, taking particular interest in the importations from Japan. Whilst in his humility he did not consider himself a botanist, yet he was so in the truest sense of the word, for he continued an ardent and devoted student of that science, and whenever any object engaged his attention and regard—whether shrubs, flowers, ferns, &c., he made a study of procuring books bearing on the subject, and of visiting such nurseries or other places as afforded him an opportunity of seeing specimens and of obtaining them for himself, and this love of collecting whatever was new and interesting to him, and enjoyment in the results of his efforts continued in full vigour to the last. His death occurred on the 3d of April 1879.

Among our Resident Fellows we also mourn the loss of Dr James Cumming, a young physician of high promise, whose sun has gone down at noon. He graduated as M.B. and C.M. in our University in 1868, and became house surgeon to Professor Lister in the Royal Infirmary. Influenced no doubt by this position he was fired with the zeal of his master, and chose as the subject of his thesis, "An Enquiry into the Theory and Practice of Antiseptic Surgery," for which he obtained a gold medal when he took his degree of M.D. in 1871. The thesis is characterised by learning and ability, and exhibits his powers of original research. He availed himself of the advantages which Berlin and Vienna afford by studying at these cities. On returning home he was appointed one of the medical staff of the New Town Dispensary, and shortly afterwards he was elected to the office of extra physician to the Sick Children's Hospital, and ultimately to that of ordinary physician to that institution. He was a Fellow of the Royal College of Physicians, and assisted his father in an extensive practice. He communicated to the "Edinburgh Monthly Journal of Medical Science" a very interesting and instructive article on the "Uterine Souffle and the Fœtal Heart," while his last production on "Alopecia Areata," which appeared in the pages of the "Practitioner," was a paper of great merit, and augured well for his future

career, had he been spared to lecture on cutaneous diseases, which, I believe, he had contemplated doing; but alas! in the very beginning of his usefulness he was called to cease from his labours, having died on the 9th of May 1879.

Latterly his time was mainly taken up with his professional duties, but in his student days he took a deep interest in the botanical excursions connected with the class, and from few, if any, of them was he absent; and even after he had obtained his degree he still manifested a sincere regard for botanical science by making an annual excursion in company with a few friends. He communicated to our Society a paper, entitled "Notes on Microscopic Fungi," which was subsequently published in our Transactions for 1872, illustrated by several lithographs, which he generously contributed out of his own resources. In his experiments he employed infusions of various substances, and marked the corpuscular or filamentous fungi which were developed after from 10 to 30 days' exposure to the atmosphere. It is an article of considerable merit, and contains some interesting results. For example, he found that there are certain forms of fungi proper to certain fluids; thus he always found the same form of fungus in Digitalis, Aconite, and Claret. He found also that in certain vegetable substances containing alkaloids, the special action of these alkaloids was in a great degree retained, even though bacteria and vibriones had made their appearance. He found this in the case of the alkaloids contained in *Tinct. Digitalis*, *Tinct. Aconiti*, *Tinct. Physostigmatis*, and *Liquor Strychiæ*. The result is important as modifying Dr Bourdon's statements. This paper seems to have been suggested while studying the "Germ Theory," and making experiments on the subject in connection with his thesis, and it gives us a hint how in societies such as ours secondary- or bye- or waste-products, as they are called, may be utilized.

His memory is fragrant among all who knew him as a man of a frank and gentle disposition, thorough uprightness of character, faithfulness and conscientiousness in the discharge of his duties, and kindness and considerateness in his attention to the sick poor.

Karl Heinrich Emil Koch, one of the most eminent horticultural botanists, was born on his father's estate, Ettersberge, near Weimar, on June 6, 1809. From early boyhood Koch exhibited an ardent love for plants, so much so, indeed, that it seriously interfered with the regularity of his training at school. His father, who seems to have been a man of a stern and unsympathising disposition, and who had already decided that his son Karl should succeed him in farming his estate, would make no allowance for the peculiar bias and precocity of the little botanist, but considered all his pursuits in collecting and studying plants as but another name for a life of idleness. His mother, on the other hand, had a kind and loving nature, but even she could not understand the peculiar conduct of the boy; and when in consequence of the warlike times his parents removed to Weimar he was obliged to conceal in a hay-loft his treasures,—books, pamphlets, and his self-collected herbarium. But Koch soon found friends outside his family circle who could appreciate his peculiar talents and his earnest devotion to botanical pursuits. Such an one was Fischer the head gardener of the Duke of Saxe-Weimar, who took a deep interest in him when he was only ten years of age, and afforded him facilities of advancing his knowledge, and even went the length of allotting him a plot of ground in the castle gardens to cultivate just as he chose. This piece of ground lay near a favourite walk of the Grand Duke Karl August, and also of Goethe; here the latter was perfectly astounded on finding an arrangement of living plants similar to that of the natural system of *Jussieu*, all accomplished by the hands of this little boy, only eleven years old, and, on the poet asking him who had taught him to do so, he received the striking and interesting reply, "I think it out for myself that it must be right," a most beautiful illustration of how a human being can either deductively or inductively grasp the divine idea from his having, at first, been made in the image of God, at least as regards knowledge. Goethe was delighted with this answer, and was in consequence led to take a deep interest in the boy and to honour him with his friendship, as he exclaimed, "We shall now work together; bring me every-

thing new and rare, which you seem to find in abundance." Goethe was much occupied with his doctrine of metamorphosis in plants, and made the boy, who was frequently roaming through the country, bring him deformed plants and such like; and the knowledge of the changes which, under so distinguished a master, Koch was privileged to acquire, seems to have suggested to him the special theme of his after life, viz., the investigation into the origin of our fruit trees. Fischer instructed him in horticulture and arboriculture, but another Grand Ducal gardener, Mr Mohs, in Bertuch's garden, took also a fatherly charge of him, and gave him instructions in the subject of fruits, which ultimately proved to have been of the highest use to him. Through his intimacy with Goethe he soon made the acquaintance of the Grand Duke, who treated him with great kindness, frequently giving him sweetmeats (for he was still but a boy), and thus a link was being formed which proved of very great importance in his future career.

As already stated, his frequent excursions in search of plants had seriously interfered with his school duties, but Koch now became alive to the necessity of more diligent application to study, which he prosecuted with such success that he soon overcame all his previous disadvantages, and in 1829 was able to enter the University of Jena. What enabled him to make such proficiency was his frequenting in Weimar the house of the privy councillor Kruse, at that time inspector of the Grand Ducal gardens, a family distinguished for their accomplishments, and here he not only improved his manners, but also his knowledge of modern languages. In Jena Koch studied medicine and became intimately acquainted with Fritz Reuter, the poet, one of the heads of the Burschenschaft (an association of students who were ardently attached to the cause of German unity, and who afterwards suffered much in seeking to promote that object). Koch's love of nature withdrew him very much from all political excitement. To him the forest and the field presented greater attractions than all the burning questions of political economy; and though to his last day he loved the noble goal at which the association aimed, yet he avoided all

political demonstrations, and escaped the sad fate of many fellow students.

The charming environs of Jena with its chalk hills, presenting an almost southern vegetation, impressed themselves on his mind. During this time he sometimes saw Goethe in Dornburg, in the enchanting parks of which the great poet loved to walk, and Koch to the end of his life preserved a myrtle branch which Goethe had presented to him when the former found him sitting in a rose-arbour reading the poet Tasso. In 1831 Koch left Jena and went to Würzburg to enrol himself among the pupils of the celebrated physician Schönlein. In the autumn of 1836 he made a journey to Switzerland, and studied the Flora of the Alps up to the sources of the Rhine and Rhone. In 1833 Koch took his degree of Doctor of Medicine, his dissertation on that occasion being a monograph on the genus *Veronica*, and then returned for a short time to Weimar, when his father was reconciled to him. He again visited Jena to take the degree of Doctor of Philosophy and to become a lecturer there. In 1834 he delivered his first course of lectures, which were distinguished by the absence of all pedantry and by a freshness and learning which gave them a peculiar interest. His excursions were not less so, and the zeal and enthusiasm with which he himself was fired could not fail to make themselves felt among his students. In March 1835 he was appointed to a professorial chair, and having now the means of gratifying his love of travel he planned his voyage to the East, in the accomplishment of which he was aided by the means which he had inherited on his father's death. Koch, probably influenced by the consideration that in the East had been the cradle of the human family, and that there had been situated the garden of Eden, stocked with every kind of fruit which could conduce to the enjoyment of our first parents, determined to seek the origin of our fruit trees in that locality.

Besides his pecuniary resources he enjoyed other special advantages, for Froriep and Friedrich von Müller seconded his efforts, and drew the attention of the Grand Duchess Maria Paulowna to his bold undertaking. She was the sister of the Emperor Nicolas, the mother of the excellent

Empress Augusta, and Koch found her to be a most gracious and friendly protectress. She furnished him with letters of introduction and recommendation to the Czar. Before setting out on his journey, which he did on May 4, 1836, he formed an engagement with the daughter of the Professor of Mathematics at Jena—Miss Theresa Weichhart, sixteen years of age. The marriage, which proved a most auspicious union, took place on October 2, 1838, after his return from the Caucasus. In his journey he first visited Berlin, where he enjoyed the intimate friendship of Ehrenberg and Alexander von Humboldt, who introduced him to Dubois de Montpereux, who had just returned from the very regions that Koch was about to visit. He then went to St Petersburg, Moscow, &c., and reached Tiflis. Here he was seized with a fever, brought on by a sun-stroke, but here also he formed the friendship of Prince Constantine Suworoff, who tended him during his illness with a brother's care. After Koch's return in 1838 he was appointed Assistant Professor of Botany at Jena, and in 1839 published a work entitled "The Natural System of the Vegetable Kingdom exhibited in the Flora of Jena." In the "Report of the German Naturalist Society" for 1840 he published "His Journey to the Caucasus," and "The Plants of the Caucasus;" while in "Linnæa" for 1841–3 there appeared from his pen "A Catalogue of Plants collected in the years 1836–7 in his Journey through the Caucasus, Georgia, and Armenia." He then, in 1842–3, published his journey in the form of a book of much celebrity, under the title of "A Journey across Russia to the Isthmus of the Caucasus," which was no less valuable for its contributions to geographical than to botanical science. Through the influence of Humboldt, Ritter, and Gustav Rose, he was sent by the Berlin Academy of Sciences on his second journey, with George Rosen, the young linguist, as his companion. In May 1843 he started for the eastern provinces of Turkey, and again scaled the Caucasus, and brought treasures from regions probably never before visited by a botanist. Near the close of the following year (1844) he returned home, and published in that year "Meteorological Observations taken at Bucharest," in the "Monthly Journal of the Berlin

Geographical Society," and "Contributions to the Flora of the Northern Maritime Coast of Asia Minor." He also published "Some Remarks on the Plants collected by Dr Thirke on the North Coast of Asia Minor, and on Olympus in Bithynia."

In 1847 he gave up his chair at Jena and removed with his family to Berlin. Here he formed most intimate friendships with Ehrenberg, Mitscherlich, Heinrich and Gustav Rose, Poggendorf, &c., and in 1846–7 he brought out his work in three volumes, entitled "Wanderings in the East." In 1848, in the "Monthly Journal of the Berlin Geographical Society," he published an article "On the Forests of the Caucasus in relation to the War at present being carried on there," and in the "Botanische Zeitung" for the same year, a paper "On the so-called Persian Insect Powder," which has an additional interest now since the Pulegium is attracting such attention as an insecticide. In the spring of 1849 Koch was appointed assistant to Link as Director of the Royal Botanical Garden, and in that year began his lectures at the University. From 1848 to 1851 he gave a series of papers in the "Linnæa," being "Contributions to a Flora of the East." In 1849, "*Acanthopleura*, a new genus of *Umbelliferæ*," appeared from his pen in the "Botanische Zeitung"; while in 1850 he wrote "On Manna, specially that of Hither Asia." In 1851 he published an excellent map of the Caucasian Isthmus, with various scientific notes, geographical, botanical, &c.; and in the same year he furnished to the Berlin Monatschrift a review of the Flora of the Caucasus for illustrating the above mentioned map. In 1852 he accepted the office of Secretary to the Horticultural Society of Berlin, and the prosperity of that Society was in great measure owing to his exertions. He retained this position till 1873, and during the portion of this time up to 1857 he edited the Transactions of that Society, and after that period he brought out his own weekly journal. In 1856 he published a paper "On the District about the River Rian" (the ancient Phasis) in "Petermann's Mittheilungen." From 1856 he represented German Horticulture at all International Congresses, and was sent as Commissioner of the Prussian Government to London, Paris, Amsterdam, St Petersburg,

Ghent, Brussels, Hamburg, Vienna, Trieste, and Florence. He was ever ready to undertake all the trouble which these various missions involved. From his acknowledged ability he was in innumerable cases called upon to act as umpire, and in this capacity he always excelled by strict conscientiousness, and the quickest discernment sharpened by much experience. Besides the numerous papers above referred to, many more came from his prolific pen, as, for example, "A Monograph on the genus *Æsculus*," "Notice on the genus *Philadelphus*," "A Monograph on Agaves," all in 1862, and "A Study of the Agaves" in 1866; "On the Classification of the Species of Crocus," "The New Holland Gum-trees—Eucalypti," "The Oranges—Citri."

The *Bromeliaceæ* and *Araceæ*, so far at least as their cultivated genera were concerned, specially engaged his attention; thus in 1862 he wrote his "Study of the *Bromeliaceæ*," in the "Belgian Horticulturist," while the Arads were treated in a paper entitled "A few words on *Anthurium*, *Philodendrum*, and *Monstera*," and in another styled "A Notice on the *Caladium*, and Description of a new Species *Caladium pusillum*."

In 1869 the first part of his "Dendrologie" appeared, which was a treatise "On Trees, Shrubs, and Under-Shrubs which are cultivated in the open air in the Centre and North of Europe," which sustained his high reputation, and contains much useful information in his attempt to trace our cultivated fruit trees to their original sources.

In 1874–5 Koch gave popular lectures on horticulture to the upper classes of the German capital. His extensive acquaintance with his subject gained from thorough personal observation, his genial nature, and real eloquence captivated his audience, and for the time brought this branch of science into the ascendant. But the subjects chosen had also doubtless no small share in bringing about this happy result, for in the first division of his lectures we find the following heading—"The History of Gardens, including those of the Egyptians, the Semitic Races, the Persians, the Chinese and Japanese, the Greeks and Romans, Italians, French, Dutch, and English. The second division related to the life and growth of trees, and their relations to man and climate,

where the subject of Miasmata, &c., is treated. The third division deals with coniferæ—a subject whose importance is universally acknowledged.

I cannot conclude without remarking that Koch's *patriotism* was a very prominent feature in his character; to him "das Vaterland" was really what the name implies, and for it he refused some excellent offers of preferment in Russia, Austria, and Belgium. He had a most independent and thoroughly unselfish nature, was possessed of vast energy, great amiability and benevolence, and was unswervingly truthful. His turn of mind was of an eminently practical kind, and hence his motto was,—"The end and purpose of all science is the mental and physical welfare of all mankind." As a botanist he held a first rank, but from his utilitarian tendency he chose rather the horticultural branch of the science as his special path, and all Germany has reaped the benefit of his devotion to this department, for his reports on "Fruit Culture in the German Empire, and the Fruit Crops of the Year," were full of useful information, and, like all his other writings, were characterised by great accuracy, and tended to promote the cultivation of fruit, while, at the same time, they pointed to the best varieties. Koch aimed at becoming Director of the Botanical Garden of Berlin, and this wish was gratified by his being appointed to that office on the death of Alexander Braun, but unfortunately his health began to fail, and he resigned this honourable post after having held it only for a year. He longed to have an Arboretum at Berlin, and so completely was his mind set on this object that he had planned the whole, though there seemed little prospect of its being accomplished, but his longings and efforts and toils were destined to be ultimately rewarded, for on the last day of his life he received the news that the Minister of Agriculture had issued a grant for the founding of a Dendrological Garden. The various objects which had occupied him were fast coming to a close, for only about thirty hours before his death he had completed the writing of what proved to be his last work, viz., "The Trees and Shrubs of Ancient Greece," and their application in an æsthetic point of view. Koch, whose special and profound observations were directed to the origin of certain species,

had no sympathy with the theory of Darwin, or with modern scientific atheism, with its darkness, chilliness, and gloom, for when the evening sun illumined his room with its rays, he exclaimed with a radiant smile, "Now, I am in God's beautiful free Nature." He bade his wife good night, and on May 25, 1879, fell into a sleep from which he never awoke in time, being within twelve days of having completed his seventieth year, which great preparations were being made to celebrate in a manner worthy of one of such renown. Alas! how true it is that "Man proposes but God disposes."

Dr Charles Murchison is one whose loss we all deeply deplore, and as my old classfellow at the University I may be permitted to say that I felt a special pang when I heard of his decease. He was indeed a many sided character, but "*Nihil tetigit quod non quoque ornavit*," for whatever he undertook, to that he applied a mind characterised by much acuteness and soundness of judgment, and well stored with facts and observations. His was not the sparkling genius; nor did he captivate us with his eloquence; his was the substantial plodding work undertaken and prosecuted by a mind of large capacity, comprehensive range, and varied acquirements, so that when at length the work was completed, it bore on its very face the impress of distinguished ability, transparent honesty, and lasting value. No wonder, then, that in Murchison's death we felt that a prince and a great man had fallen, for the high position which he occupied was one to which his merits had justly raised him, and on which he reflected a bright lustre. He was at the time of his death one of our Non-Resident Fellows. As a short notice of Murchison was read before our Society during last session, I shall not devote to his biography that amount of space which would be justly his, and without which one could not even enumerate the important and varied positions which he occupied, and the valuable contributions to science, but specially to medical science, which came from his pen.

Dr Murchison was born in 1830 at Springfield, Vere, Jamaica, and was the son of Dr Alexander Murchison, and grandson of Professor Copland of Aberdeen University.

He began his medical studies in Aberdeen in May 1846, but soon removed to Edinburgh, and in November of that year we find him a student in our University, where he most successfully prosecuted his studies, carrying off prizes and medals in many classes, and obtaining at the end of his career the gold medal for his Graduation Thesis in 1851. As a student of botany I remember his ardour and devotion to that science, and how he astonished us all in 1848, when he handed in the beautifully and accurately executed dissections of certain natural orders, which now adorn the museum at the Botanic Garden and will hand down his fame as a laborious and able student. I should have mentioned that in the previous year (1847) he obtained three botanical prizes at the University, and was elected a member of our Society. In 1849 he was chosen a member of our Council, when only nineteen years of age, which shows the high esteem in which he was held as a botanist. In 1848 he contributed a paper to our Society (Dec. 14) "On certain Glandular Bodies occurring in the Epidermis of Plants," and in 1851 he supplied another "On certain Monstrosities of *Leontodon taraxacum* and *Trifolium repens*."

After obtaining his degree he was for a short time Physician to the British Embassy at Turin, and again returned to Edinburgh and acted as resident Physician in the Royal Infirmary, and then passed a few months in the Maternity Hospital here, and thereafter went and studied at Paris. In January 1853 he entered the Honourable East India Company's service, and in the same year was appointed to act as Professor of Chemistry in the Medical College at Calcutta. The whole current of his after life might have been changed, and we might now have been recording his achievements in chemistry and his extension of the boundaries of that science rather than those of medicine, had not some difficulties in regard to the Medical Department in Burmah, where great sickness prevailed, rendered it needful that he should be sent thither, and accordingly in compliance with the call of duty (but much against his own inclination) he left Calcutta; while in Burmah he was not inactive, but sent valuable papers on the climate and diseases there, which

appeared in the "Edinburgh Monthly Journal." He there also made observations in April 1854 near Rangoon on the *Flata limbata*, which he afterwards communicated to the Linnæan Society, to which I shall immediately refer.

In 1855 Murchison left the Indian medical service and returned to London, where he became a Member of the Royal College of Physicians. In this year his article entitled "Notes on the White Secretion of the *Flata limbata*, and on its relation to the Insect White Wax of China," was contributed to the Linnæan Society, and published in their "Proceedings." It is an able and well-reasoned paper, and seems to justify his conclusion, that, while Hanbury was right in regarding the *Coccus pela* as a source of Chinese wax, he erred in excluding *Flata limbata* from that honour, for it seems highly probable that it is one of the sources of that supply. In December 1855 he contributed to our Society a paper "On the Chaulmoogra Seeds of India," the produce of *Chaulmoogra odorata*, Roxb., or *Gynocardia odorata*. After referring to the poisonous nature of the tree, but the bland character of the seeds, and of the expressed oil, he proceeds to show how it is employed, and what a high reputation the latter has in India in cutaneous affections, and even in leprosy, and that it is also highly prized by the Chinese. He acted as Demonstrator of Anatomy at St Mary's Hospital during the same year, but this office he soon resigned, and was appointed in 1856 Lecturer on Botany in that Hospital. His next appointment was that of Assistant Physician to King's College Hospital in 1856. In 1859 he became a Fellow of the Royal College of Physicians. He was also a Fellow of the Royal Society. In 1860 he was elected Assistant Physician, and in 1861 Physician to the London Fever Hospital, an appointment to which we are in great measure indebted for that noble work on "Continued Fevers" which made his name famous, and which will remain a lasting monument of those high faculties of mind which he largely possessed, and of the unwearied diligence and great accuracy and honesty with which he prosecuted his extensive researches. The first edition appeared in 1862, and the second in 1873. In 1861 he edited for the New Sydenham Society "Frerich on Diseases of the Liver." I pass over some appoint-

ments at Middlesex Hospital in 1860 that I may not weary you with too many details. About 1867 he lost by death his great friend Dr Hugh Falconer, the famous naturalist, who was superintendent of the Government Botanical Gardens, and whose guest Murchison had been on his first arrival in India. Animated by warm feelings of regard for the memory of the deceased, he initiated a movement to perpetuate that memory, which found its fitting expression in a Falconer Memorial Fellowship in our University, to which Murchison's generous heart was always linked. He also re-edited the Geological and Palæontological MSS. of his friend.

In 1868 he published his "Clinical Lectures on Diseases of the Liver," which maintained his high reputation. In 1869 his *alma mater* conferred on him the well-earned honorary degree of LL.D.

In 1871 Murchison accepted the invitation to become Physician to St Thomas' Hospital, and Joint-Lecturer on Medicine. In 1873 he delivered the Croonian Lectures on "Functional Derangements of the Liver," which he subsequently enlarged and published. He was appointed Examiner in Medicine in the London University in 1875; and in 1877 he was chosen President of the Pathological Society; and only this year he was appointed Physician in Ordinary to the Duke and Duchess of Connaught. It would be out of place here to record the numerous medical papers which he wrote, and which all partook more or less of the same excellences, so I conclude in the words of one who knew him well, and who employs no language of hyperbole, but shows a just appreciation of his character when he writes—"Judicious in character, calm and sober in his modes of thought and expression, methodical and laborious in investigation, keen and acute in the interpretation both of the symptoms and of the causes of disease, unwearied in unravelling difficult questions, just and impartial in conduct, plain and sincere in manner, trustful, affectionate, and reliable as a friend, Dr Murchison possessed those qualities which we are apt to regard as helping to form the best type of a British Physician."

David Moore, a name illustrious wherever botany and

horticulture are studied, was a Non-Resident Fellow of our Society, and we unfeignedly mourn his loss. He was a Doctor of Philosophy of Leipzig. He was born at Dundee in 1807, and in early life was employed in the gardens of the Earl of Camperdown, near that town. After leaving that situation he came to Edinburgh to the nurseries at Comely Bank, then belonging to Mr James Cunningham, and remained there till 1828, when he went to Dublin to assist Dr James Townsend M'Kay, author of the "Flora Hibernica," who was then the Director of the Botanical Garden of the University of Dublin. He profited by the advantages which this position afforded, and was appointed one of the staff of the Ordnance Survey of Ireland. The judicious nature of this appointment was evidenced by an able paper written by Moore on the Flora of the regions examined, which were, I think, the counties of Antrim and Londonderry. After holding this post for five years he was chosen Curator, or (as subsequently) Director of the Glasnevin Botanic Garden, which is the property of the Royal Society of Dublin, and originated in an annual parliamentary grant for its establishment and support, given for the first time in 1790. No sooner had he entered on the duties of his new office, which he did in 1839, than his energy and ability displayed themselves in gradually raising the garden from being comparatively insignificant, to take its place among those in the highest ranks, and that in no small degree by the treasures which he himself collected for it. King Lemuel's description of a virtuous woman could most appropriately be applied to Moore, for like the merchant-ships he "brought his food from afar," Prov. xxxi. 14; for Norway and Sweden, Germany and France, Italy and Spain, and even Russia, were visited by this indefatigable horticulturist, that fresh treasures might be added to the Glasnevin collection; and hence the garden was distinguished by all that was beautiful and rare, and hence also from that source many of our new plants (whether open-air or hothouse) were imported. He rendered it famous also for the variety of new hybrid forms which by his skill and ingenuity he raised there.

The Glasnevin Botanic Garden, which owes so much to

him, extends over 27 acres, and is divided into three sections, relating to Agriculture, Horticulture, and Botany.

Moore devoted much attention to cryptogamic botany, especially to the *Musci* and *Hepaticæ* of Ireland (in the department of Mosses he earned a high reputation), and he published on these subjects, as well as on *Gramineæ*. He gave valuable aid to his former instructor Dr M'Kay in making up his list of Irish plants, and, conjointly with Mr Alexander Goodman More, he edited the "Cybele Hibernica" in 1866, in which the geographical distribution of plants in Ireland ~~were~~ was dealt with. M'Kay's work, the "Flora Hibernica," is one of special merit, but in it few localities are given, and no attempt is made to define the range or frequency of the plants, and it is apparently with the view of supplying this deficiency that the "Cybele Hibernica" was undertaken. It everywhere exhibits extensive reading and careful research, and the method pursued for the avoidance of errors is a model of caution. No wonder then that a grant of £25 was given by the British Association towards its publication. No descriptions of the genera or species are given, as the authors strictly confine themselves within the prescribed limits, and leave the reader to gain that information from the other sources, which are plentifully supplied in the published manuals. In this work he divided Ireland into twelve botanical districts, such as had been suggested by Professor Babington. A map of these districts is contained in the book.

At the Moscow Exhibition of 1865, and at that of Paris in 1867, he acted as Botanical Commissioner.

He was a Member of Council of the Royal Irish Academy.

Amid all his renown, however, he was humble and unpretentious, of an amiable disposition, and was esteemed and respected by all those with whom he came into contact. Though his lot was cast in Ireland, he was a thorough Scotchman, and one of our countrymen of whom we may justly be proud. He possessed that indomitable perseverance, high intelligence, and sound common sense, which have by all generous minds been regarded as characteristic of our nation, and to the development of which the kind of education which they have enjoyed,

embracing as that does the training of the whole man, as an intellectual, moral, and spiritual being, has so powerfully contributed.

An acute disease cut short his life in the midst of his activity and usefulness, his physical and mental powers exhibiting no signs of natural decay, though he had by two years surpassed the threescore years and ten.

On September 16, 1879, our Society lost another able and energetic horticulturist in the person of Mr Peter S. Robertson, at the age of sixty-one. He was born at Dalchonzie, near Comrie, of parents who were in very humble circumstances. He was sent to school at Dunira, and afterwards served a regular apprenticeship at Drymen, under Mr Montgomery, gardener to the Duke of Montrose. In 1837 he got a situation in the Royal Botanic Garden here, under the father of our late Curator, than whom no one was better qualified to train those under him to a thorough knowledge of their vocation; and we may be sure that with Robertson's abilities and good common sense, the six years' training which he here underwent would not be in vain. From the Botanical Garden he went in 1843 to the Messrs Peter Lawson & Son, where he remained for sixteen years, during fourteen of which he held the position of manager. His advantages here were very great, and his acquaintance with the seed trade was correspondingly extensive.

A friend informs me that Mr Robertson had an ardent desire for knowledge, and a great propensity to launch into new fields of discovery, and was animated by an enthusiasm for the beautiful in plant form, which roused even unimpassioned natures to a like feeling. When he started on his own account he was most enterprising, and his efforts were crowned with success; for having begun business at Trinity, he was not long ere he extended his nurseries to Inverleith Row and Stanley Road. His ability both as a nursery- and seeds-man were soon publicly acknowledged by his being frequently called upon to act as a valuator in both departments. If there was one feature more than another in which the excellency of his nurseries appeared, it was in the hardy trees and shrubs to

which he devoted special care, and which he cultivated with much success. He knew flowers well, not only those of the greenhouse and under cultivation, but also the wild flowers of our country. I am informed that Mr Robertson, mindful of his own early struggles, interested himself in the welfare and prosperity of the younger members of the trade, and was very helpful to young foresters and gardeners by advice and sympathy, that he proved himself a kind and constant friend, and was esteemed by those who knew him. His death, which resulted from disease of the heart, was sudden.

Mr William Mudd, Curator of the Botanical Garden at Cambridge, died of a brief illness at the age of forty-nine. He was an Associate of our Society, as well as of the Linnæan. He was born near Bedale, in Yorkshire, in 1830, where his early education was very deficient. His first appointment was to the garden of Joseph Pease, Esq., at Southend, Darlington, where he enjoyed the advantage of good training under Mr Pope. He married in early life, and was appointed to the charge of the garden of T. Richardson, Esq., at Great Ayton in Cleveland. While here he became acquainted with some teachers in a boarding-school in the neighbourhood who were fond of science, and by their aid he strove to supply the defects of his education. He also made long botanical excursions through the district, the results of which were published in a local periodical in 1863. A new era now dawned on his history. He purchased a microscope and devoted himself to the study of lichens, and by dint of great industry, zeal, and self-denial (for all this time he was regular at his garden duties), he secured a fine collection of these cryptogams, which he carefully dissected and accurately described. Shortly after this, viz., in 1861, he published his "Manual of British Lichens," which was very complete, containing as it did all the species and varieties then known in Britain. This work gave him a high position as a botanist, and with his previous thorough training and experience in horticulture, we need not be surprised that, when a vacancy occurred in the curatorship of the Botanic Garden at Cambridge, Mr Mudd should have been chosen to fill that

important office. He would, doubtless, in his new sphere have prosecuted with no less energy and success his studies in lichenology, had not the state of his eyes prevented him from using the microscope. He accordingly was compelled to abandon that pursuit; but, being of an active disposition, he, in addition to discharging his duties as Curator, occupied his time in giving instructions to those studying for the Natural Science Tripos, and for the special examination in Botany, in which he proved a most efficient teacher, and gained the affection and esteem of all his pupils. Dr Babington thus writes of him—"He raised the standard of the botanical garden;" and again—"We have lost a very valuable man, one who had the interest of the university and garden thoroughly at heart, and worked constantly for the advancement and benefit of all subjects of his department."

Dr Johann Friedrich Thilo Irmisch, Professor of Botany at Sonderhausen, Thuringia, was a Foreign Member of our Society. He died of apoplexy at Sonderhausen, on the fourth day after the attack, viz., April 28, 1879. He was a man of great eminence, and his name spread far beyond the limits of his native country. We grieve over the loss which our Society and botanical science in general have sustained by his removal, while his personal friends mourn over his departure, and speak of him as a most amiable, simple, unpretending character, full of warm feeling for friendship and domestic happiness; in fact, he was artless as a child, destitute of that ambition which aims at high positions and outward honours, as evidenced by his refusing several honourable invitations to other university chairs, thus at the same time exhibiting the like patriotism which we have seen in Koch and Grisebach, for he was warmly attached to his beloved native town, whose rich and beautiful flora had peculiar attractions for him; and yet, with all his modest retirement, he was a man of high culture, as his education, and literary and scientific writings testify.

Irmisch was born on January 14, 1816, at Sonderhausen. His childhood was spent in the small town of Schlotheim, belonging to the precincts of Schwarzburg-Rudolstadt, and situated between Sonderhausen and Mühlhausen, where his

father was a forester. Even in his school days he took a lively interest in botany, and devoted his leisure hours to its prosecution. In course of time he attended the college at his native town, and afterwards studied theology and philosophy at Halle; but he specially applied himself to the natural sciences, under the care of Professor von Schlechtendal, Burmeister, and Germar, but more particularly to botany. He then obtained a tutorship in an excellent family, which he retained for some years; and was thereafter appointed as a teacher at the princely college of Sonderhausen, and here he continued to act as professor till removed by death.

He was indefatigable in his prosecution of botanical science, and by his numerous and able writings soon attracted the attention of the principal botanists of the day; and for years he lived in constant scientific and intellectual intercourse with the most eminent scholars of Germany and foreign countries. Alexander von Humboldt, St Hilaire, Francois Guizot, Treviranus, Martius, and many others, favoured him with their attention and correspondence. His principal works are in the province of the Morphology of Phanerogamous Plants, especially of the underground portion of the axis in Monocotyledons. The Philosophical Faculty of the University of Rostock, granted him the honour of the degrees of Doctor of Philosophy and Master of Arts *honoris causâ*, and in the diploma they thus speak of him :—"This skilful scholar, by keenness of sight, has most happily observed the most hidden mysteries of plants, both under and above ground; he has most skilfully expounded, and most learnedly illustrated them."

The number of societies which admitted him to their fellowship is another proof of the high estimation in which he was held. He was a member of the Antiquarian, and an honorary member of the Agricultural Society of Sonderhausen. He was also Keeper of the Natural History Museum there. He was a member of the Royal Bavarian Botanical Society of Regensburg; and also of the Association for the Science of Nature in Saxony and Thuringia; and of the Society of Natural Philosophers of Halle. He was also a member of the Physico-Medical Society of

Erlangen, and of the Botanical Association of the province of Brandenburg, in Berlin. He was likewise a member of the Grand Ducal Saxon Society of Mineralogy, Geology, and Palæontology in Jena; of the Association of Naturalists in Bremen; of the Royal Botanical Society of Ratisbon; of the Society for Natural Sciences in Cherbourg. He was an honorary member of the Association of Naturalists of the Bavarian Palatinate; and of the Philomathic Society of Strassburg. His government honoured him with the medal for Art and Science. Since 1866 he has been a member of the Imperial German Academy Leopoldino Carolina of Natural Philosophers.

In 1874 he was appointed Keeper of the Archives, and devoted the last years of his life, when he was less able to undertake botanical excursions, to the investigation of the more ancient parts of the history of the princely house of Schwarzburg, and it has been said of him that, "the forty-seven contributions to the knowledge and history of Schwarzburg, which he published in the 'Sonderhausen Government Journal,' conducted by himself, are a fair proof of his restless activity, and are of lasting value."

The mere mention of the titles of his botanical treatises, which amount to about 100, would occupy all our time, so I can only indicate a few—

1. Additions to Meyer's *Chloris Hanoveriana* from the district of Hohnstein, 1838.
2. Description of a remarkable Irregularity in the Flowers of *Hordeum himalayense trifurcatum.*
3. Remarks on the species of *Epipactis* of the German Flora, 1842, and also
4. Addition to these Remarks, 1847.
5. Description of the Rhizome of *Sturmia Loeselii*, 1847.
6. On some Gamopetalous Flowers, 1847.
7. Monstrous Flowers of *Anemone*, 1848.
8. On the Inflorescence of Fruit-bearing Plants of *Humulus Lupulus*, 1848.
9. On the Morphology of Monocotyledonous Plants, 1850, Berlin. 10 plates.
10. Contributions to the Biology and Morphology of Orchids, 1853, Leipzig. 6 plates.
11. The Structure of the Shoots and Buds of *Aconitum Napellus*, 1854.

12. Contributions to the Comparative Morphology of Plants, 3 parts, in 1854–5–6 respectively, with 13 engravings. 4th part in 1863. 5th part in 1874, Halle.
13. Morphological Observations on some Excrescences (Growths) of the Natural Families *Melanthaceæ*, *Iridaceæ*, and *Araceæ*, Berlin, 1854. Folio, with 2 plates.
14. Contributions to the Morphology of the *Amaryllidaceæ*, 1860, Halle. 12 plates.
15. On some *Fumariaceæ*, Halle, 1862. Quarto, with 9 plates.
16. A small contribution to the Natural History of *Microstylis monophylla*, 1863.
17. Some Observations on *Scilla autumnalis* and *S. bifolia*, 1863.
18. On some *Ranunculaceæ*, 1865 and 1868.
19. On the Natural History of *Stratiotes aloides*, 1865.
20. On *Aconitum anthora*, 1873.

Thiloa, a genus of *Combretaceæ*, and Irmischia one of the *Asclepiadaceæ*, were named in honour of this eminent botanist, but in the "Genera Plantarum" these names do not occur, nor are they needed to perpetuate his name, for by his many valuable works "*exegit monumentum aere perennius*," and by his many excellent qualities he is embalmed in the hearts of all who knew him.

Samuel Hay was the youngest son of the late Sir John Hay, Baronet. His father, Sir John, was a leading partner in the well-known and old established house of Sir William Forbes & Company.

Mr Hay was brought up originally as a merchant, and, for some years, was established at Havre, but he removed from that position and came to the bank at Parliament Square, where he was made secretary and then a partner, and continued connected with that private bank until its fusion with the Union Bank of Scotland. He continued, till within a short time of his death, as one of the managers of that bank. As a friend informs me, he took a deep interest in everything connected with the prosperity of the city, and was esteemed.

He also took a great interest in many Societies, and was a Resident Fellow of ours. Though latterly he did not attend our meetings, yet at an earlier period he did so, and was also a Member of Council. Horticulture seemed

to attract his attention, and in his garden were found some of the most recently imported plants.

The two following Fellows had been omitted last year in the obituary list, but, as I got notice of them from the Secretary only a few days ago, I have been unable to do anything like justice to their memories:—

Matthew Alexander Eason Wilkinson, M.D. of Edin. in 1838, died at his residence, Greenheys, Manchester, on July 26, 1878. His death was caused by disease of the heart, accelerated by bronchitis.

He was born at Manchester, and spent the whole of his professional life in that town, where he was held in the highest respect and esteem. Those who knew him best considered the possession of his friendship as a great privilege, for he had a high sense of professional honour. His philanthropy was free from everything like ostentation, and his whole deportment towards his fellows was marked by peculiar kindness and courtesy, so that their esteem of his high professional ability and attainments deepened into genuine love of the man. He was at one time officially connected with the Deaf and Dumb Institution, and the Ardwick and Ancoats Dispensary; and was appointed in 1844 to the office of Physician to the Royal Infirmary, which he held till his death. The high estimate which the profession had formed of him as a physician, &c., was expressed by his being called upon to fill the presidential chair of the British Medical Association. In this post of honour he had acquitted himself to the satisfaction of all, having proved himself most diligent, faithful, energetic, and judicious, in forwarding the interests of the Association; and there was little more than a week to pass ere he would have resigned the chair to his successor, when the sad event occurred to which I have referred.

His address prepared for that occasion, but which, alas! was read by other than his own lips, proves the fine and noble estimate which he had formed regarding the true dignity of the medical profession; for, after referring reproachfully to the influence of private interests engendering pitiable jealousies, to the unworthy ambition of

merely "getting on," and to the sordid avarice of merely making money, "instead of the gallant *esprit de corps* and steadfast pride in raising and upholding our grand profession," he went on to define what a doctor in the true sense ought to imply. "It means," he said, "a costly, and though a very interesting, yet a very anxious and laborious education; it means, in all who are worthy of the profession, enormous self-denial, earnest thought, truthfulness, integrity, purity of life, sympathy with human suffering, unceasing labour, obedience to God's word." And, he continues, "we must endeavour to influence all who are about us to look upwards and onwards in the highest sense, *i.e.*, in the hope of being an honour to their calling and a blessing to their generation, and not in damaging aim at self-aggrandisement." These were no empty words, but were exemplified in the life and character of the man who *wrote*, but alas! never *uttered* them.

Of Dr Wilkinson some longer and better notice should have been prepared, and yet, viewed in another light, it may with equal truth be affirmed that such a man needs no monument, for his deeds of benevolence, and the high tone of character from which they proceeded, justify us in adopting the trite quotation, "*si monumentum quæris, circumspice.*"

During his student days he showed his love of botany by joining our Society as a Resident Fellow in 1836, and after returning to Manchester, he was one of our Non-Resident Fellows. Though I am not at present aware of any contributions to our "Transactions," yet, that he was attached to the Biological Sciences, the above facts indicate, when conjoined with the circumstance that he was an Extraordinary Member of the Royal Physical Society here.

William Bruce Cunningham, Minister of the Free Church, Prestonpans, is another of our Non-Resident Fellows, whose loss we are called upon to mourn. Combining, as he did, high intellectual gifts with an ardent love of science, his name reflected honour on any Society with which he was connected.

He was born at Musselburgh in 1806, but was soon

deprived of the fostering care of his mother, as she died six weeks after his birth. He was in consequence taken to Prestonpans, where his infancy and childhood were spent. In boyhood he removed to North Berwick, and lived with his maternal grandfather, Dr Oliver, who was a medical practitioner in that town; and here he obtained his early education. When sixteen years of age he went to Glasgow University, where he studied for four years, and after having thus completed his Arts curriculum, he came to Edinburgh to study divinity, and, what is interesting to note, was the first student enrolled by Dr Chalmers in his first session as professor here. During the five years that he attended our University he joined many Societies, and in 1827 was a Member, and subsequently Secretary, when Allen Thomson was President of the Plinean Natural History Society, and that at a time when young men of high intellectual gifts and extensive knowledge constituted the membership, and took an active part in the lively discussions, many of whom also held high and honourable positions in after life. These latter pursuits he successfully cultivated, and to them he continued to the end to have a warm attachment.

He was licensed to preach the Gospel in 1831, and was ordained to the charge at Prestonpans in 1833.

He took a deep interest in his parish, and faithfully ministered to the spiritual wants of old and young; he also with Chalmers, Cunningham, Begg, and Candlish, took an important part in the great questions of that time. When the Free Church was formed he took a prominent part in its public business. During one winter session, he delivered in the Free Church College a course of lectures on Natural Science, which ~~were~~ characterised by great ability, and into which, as being congenial to his long cherished tastes, he threw his whole soul. To the "Presbyterian Review" and the "British and Foreign Evangelical Review" he contributed freely; for in science, literature, and theology he was well-versed, and he brought to bear on these themes a mind of a high stamp, and imbued with a fine Christian spirit.

He was related by marriage to the late Professor Banner-

man, as they had each married a daughter of the late Lord Reston, one of the judges of the Court of Session.

The zeal of Mr Cunningham for science seems to have been communicated to his sons, for, while all of them have become Doctors of Medicine, the second son holding a high place in the medical department of the Indian Army, the eldest son has distinguished himself by his scientific experiments, and is Professor of Natural History in Queen's College, Belfast.

Mr Cunningham's death, which took place on August 2, 1878, has proved a severe loss to science and religion.

Regarding the two remaining Fellows I can obtain very little information.

Edward Vincent Sandilands was the youngest son of the late Lieut.-General Philip Sandilands, Royal Artillery, and was born at Hythe, in Kent, on April 5, 1847. His death, which occurred about January 24, 1871, at the early age of twenty-three, was caused by the swamping of his boat in the neighbourhood of the Fiji Islands. He was a Non-Resident Fellow of this Society, and was admitted as such in 1865. It was only this year that we became aware of his death, else his name would have been recorded in our obituary list several years ago.

Mr Alexander Graham, formerly of Kirkhill, Stirlingshire, and latterly at Brimstage, Birkenhead, was admitted a Non-Resident Fellow in July 1, 1859; but beyond the fact of his death, nothing further is known regarding him.

And now, Gentlemen, in conclusion, I cannot leave this chair, without again expressing to you my high sense of the uniform kindness and courtesy which I have received at your hands. With a Society more harmonious than this I have never been connected, and I do trust that the fine spirit which has characterised us in the past, may be equally manifested by us in the future; and that we shall strive together as one man to maintain and promote the interests of this Society, which owes its existence to the enlightened zeal and enthusiasm for botanical science

of that noble band of distinguished men, few of whom, alas! are now amongst us. As year after year is thus thinning our ranks, it is a comfort to know that so many yet remain to seize the standards from the dying hands of such noble champions of our science, and to bear them aloft with the resolute purpose of handing them down unsullied to the future generation. But, as in all societies, true success is attained, not so much by the brilliant achievements of a few, as by the steady and persevering efforts of the whole, I do trust that we may all be stirred up, each in his special sphere, faithfully, conscientiously, energetically, and with the highest end ever in view, to prosecute botanical science, ever bearing in mind the lesson which the sad obituary list is designed to teach us, that the night is coming to each of us wherein no man can work.