

essay on the Dolomite region, which was a remarkable production for so young a man.

In the midst of his Alpine work he was offered a post as geologist on a Prussian expedition to Japan, China, Siam, and the adjacent regions. The opportunity of foreign travel and exploration was too tempting to be resisted. Quitting his Austrian labours he sailed for the East, and during the next two or three years, from 1860 onwards, contributed to the scientific journals various papers descriptive of some of the tracts which he visited. Owing to circumstances which prevented him at the time from undertaking exploration in the heart of Asia, he crossed the Pacific and spent several years in western North America, where he specially devoted himself to a detailed study of the igneous rocks of that marvellously volcanic region. It was there that he prepared his now classic memoir on the "Principles of the Natural System of Volcanic Rocks," which was published in English among the memoirs of the California Academy of Sciences. This sojourn in America enabled him, moreover, to obtain a mastery of the English language, such as few foreign men of science could equal.

The opportunity of returning to Asia came at last in the autumn of the year 1868, and he eagerly availed himself of it. He spent some years in travelling over most of the provinces of the vast empire of China, studying their physical features and geological structure, and forming an extensive collection of their rocks and fossils. So voluminous were the data which he gathered together that they filled a series of massive volumes, of which the first appeared in 1877, and the Atlas in 1885. This work placed him in the front rank of scientific pioneers. It not merely made known for the first time the physical geography and geology of a vast territory, but presented contributions of great value towards the elucidation of disputed problems in science.

Richthofen's reputation as a travelled and accomplished geographer had now spread so widely that in the year 1875 he was offered, and accepted, the chair of geography in the University of Bonn, where he spent eight happy and fruitful years, and where he married the accomplished lady to whom he had been long attached. From Bonn he was called to occupy a similar position at Leipzig, whence, after only three years, he was invited to become professor of geography in the University of Berlin. In the metropolis of the German Empire he found ample scope for his rare faculties of exposition and organisation. Besides the ordinary duties of his professorship, he instituted meetings of various kinds for promoting the cultivation of geographical and geological studies, and amassed a wonderful collection of books, maps, instruments, models, and other illustrations of the physical features of the earth's surface. His enthusiasm in these efforts was rewarded three years ago by his appointment as director of the new geographical institute in Berlin, where he had ample space to arrange and display the remarkable mass of material which he had gathered together with the view of bringing home to the mind and eye the characteristic aspects of land and sea and the history of exploration and discovery in oceanography.

Baron von Richthofen was a geographer of the highest type. To him the mere addition of so many hundred square miles of territory to what was already known of the earth's surface, and the opportunity of affixing the names of friends and benefactors to peaks and promontories and inlets, were matters of comparatively little moment. It was the grand features of land and sea that interested him, their origin, their history, their relations to each other, their influence

on the progress and destiny of mankind. His early geological training eminently fitted him for investigating these problems on the ground, and kept him from making the mistakes which attention restricted to mere superficial features has so often produced. He possessed in rare measure the qualities which ensure the success of an explorer—health and strength, alike of body and mind, a wide range of natural knowledge, courage, patience, endurance, tact, and kindness. It may have been the consciousness of the possession of these qualities, combined with a recollection of the pleasure which their exercise had given him in his varied wanderings in Europe, Asia, and America, that led him to write, in the midst of his university and other work, his admirable "Führer für Forschungsreisende," which was published in 1886. No one but a born and trained explorer, who had enjoyed ample experience by flood and fell, all over the globe, could have given to the world such a volume, so full of the ripest practical knowledge, so broad in its conception of what exploration should be, and so clear and emphatic in its statement of the accomplishments which are needed for the making of a successful traveller. Every department of observation is luminously presented in his chapters, which may be regarded as a contribution of the first importance to physical geography and geology. The volume is one which ought to be put into the hands of every man who proposes to undertake the examination of new or little known regions, and who is willing to learn beforehand what is expected of him by those most competent to judge.

With Berlin as his headquarters, and a home there which attracted men from all lands, the Baron and his gracious and devoted wife formed the centre of a large circle of friends; but he journeyed far to attend meetings and congresses, where his handsome presence and genial talk were always welcomed. Hence not many men of science of his day were more widely known personally than he. He received endless marks of appreciation from learned societies and academies, both in the Old and in the New World. Our own Royal Society honoured itself by including him in its list of foreign members. His death has left a blank in scientific society which no living man is competent to fill. For many a year he will be regretted by all who even only slightly knew him, and mourned by those who were privileged to enjoy his friendship.

A. G.

THE TREASURY AND MEN OF SCIENCE.

THE subjoined letter from the Earl of Crawford appeared in Monday's *Times*. The parsimony of the Government in everything relating to the scientific work needed for the State service is well known; what is not yet known generally is how much the administration is weakened by the entire absence of science, and therefore of the scientific spirit, in the higher ranks of the Civil Service, and especially of the Treasury. The official action described by Lord Crawford is another indication of the inability of the official mind to understand that science has any place in the nation's activities.

To the Editor of the "Times."

Sir,—The death, noted by you to-day, of my dear friend and colleague Dr. Copeland, His Majesty's Astronomer for Scotland, creates a vacancy in the scientific staff of Great Britain.

Will you permit me, Sir, to offer a word of warning to any who may be asked to succeed him?

Students or masters of astronomy are not, in the

selfish sense, business men, nor are they as a general rule overburdened with this world's goods. It behoves them henceforth to take more care as to their future in case of illness or physical infirmity, and not to trust to the gratitude or generous impulse of the Treasury Department.

In old days it was the custom when a man distinguished in science was brought into a high position in the Civil Service that he was credited with a certain number of years' service ranking for pension. This practice has been done away with and a bargain system substituted. A short while ago the growing agonies of heart disease caused Dr. Copeland to feel that he was less able to carry on the duties of his post, and he determined to resign; but he learnt that under the scale, and in the absence of any special bargain, the pension he would receive would not suffice for the necessities of life. The only increase his friends were able to get from the Treasury was an offer to allow him about half-a-crown a week extra by way of a house.

Indignant and ashamed of my Government I persuaded Dr. Copeland to withdraw his resignation and to retain the official position which he has honoured till his death.

I trust, Sir, that this memorandum of mine may cause eminent men of science who are asked to enter the service of the State when already of middle age to take heed for their future welfare.

I am, Sir, your obedient servant,

CRAWFORD.

2 Cavendish Square, October 28,

The number of years given by Act of Parliament was twenty, because the ordinary civil servant joined at twenty to learn his work, and men of science joined at about forty because they had to learn it before they were of any use to a Government department.—[Ed.]

THE BRITISH SCIENCE GUILD.

THE inaugural meeting of the British Science Guild, the organisation and objects of which were stated in NATURE of October 12 (vol. lxxii. p. 585), was held at the Mansion House on Monday, October 30. The Lord Mayor presided. Among those who had accepted the Lord Mayor's invitation to attend were the following:—

The Bishop of Ripon, Lord Strathcona, Mr. Haldane, K.C., M.P., Sir Norman Lockyer, Lady Lockyer, Sir Michael Foster, Sir William Ramsay, Lady Ramsay, Sir J. F. Maurice, Sir J. Wolfe-Barry, Sir W. Bousfield, Sir G. T. C. Bartley, Sir E. W. Brabrook, Sir C. Bridge, Sir Lauder Brunton, Sir A. Geikie, Sir W. Mather, Sir H. T. Wood, Dr. G. T. Beilby, Dr. Caird, Captain Creak, Dr. Ferrier, Dr. W. Garnett (represented by his son), Mr. Gifford, Dr. Glazebrook, Prof. Gowland, Mr. R. A. Hadfield, Prof. J. Larmor, Prof. Lealey, Dr. Lockyer, Mr. C. W. Macara, Prof. Meldola, Prof. Perry, Mr. J. H. Reynolds, Dr. Shaw, Mr. A. Siemens, Mr. Swinburne, Rev. T. R. Stebbing, Mr. Carmichael Thomas, Prof. S. P. Thompson.

The following are extracts from letters expressing regret at inability to attend the meeting.

Mr. Chamberlain:—

"I am very sorry to find that I cannot possibly be in London on Monday the 30th inst. . . . I very much regret that I cannot take an active part in the meeting on this occasion, but possibly some more convenient opportunity for showing my interest may occur at a later time."

Lord Roberts:—

"I am very sorry to refuse the request contained in your letter of the 12th instant, but I have so much on hand at present that I could not manage to attend. . . . I recognise the value of the Guild and wish I could help it."

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Lord Rayleigh:—

"I fear I shall not be able to come to the meeting . . . but I shall be very pleased to join in the movement and become a vice-president if desired."

The following report of the meeting is reproduced, in great part, from Tuesday's Times:—

The Lord Mayor in a few words welcomed those who had accepted invitations to be present, and called upon Sir Norman Lockyer to read the report of the organising committee.

Sir Norman Lockyer, having read the report, said that the organising committee was grateful for the consent the Lord Mayor so readily accorded to them to hold their first meeting at the Mansion House. He had every hope that under such auspices the guild might do for British national endeavour in the future what so many ancient guilds, each in its special line of action, were founded to do in the long past. When his own views as to the importance, nay the burning necessity, of such a movement as that throughout the land, among all classes, and in touch with all employments, were expressed some time ago, he suggested that it might be brought about by extending the functions of some existing organisation, such, for instance, as the British Association; but he was soon made to see that that was to take a too narrow view of the matter. It was not a question merely of science and scientific men; it was a question of conducting all our national activities, State service, private service, and what not, under the best possible conditions with the greatest amount of brain-power. To show that it was not a question only for scientific men, he would just refer for a moment to the matter of education. He yielded to none in respect for those studies which embraced ancient civilisations and their literatures, but they alone were as incapable of forming the complete man as would be instruction in the mere facts of science apart from the actual use of the methods of observation and discovery. A complete education must be based upon things and thinking, as well as upon words and memory. We wanted one kind of education for everybody—the best. We wanted that education carried as far as possible in the case of each individual, whether the time for education was long or short. No one should be stopped, save by his own incapacity, from proceeding further down the fair stream of education which should make the complete man, both educationally and physically. We want that stream freed from the impediments with which it was at present dammed—they might spell the word as they liked. These impediments were many of them needlessly hurtful, and most of them unnecessary from a large point of view.

Indeed, they wanted to revert to the ideal of the ancient university, from the curriculum of which *natura rerum* was never absent, and in which the poor student was always cared for. The western world was wondering at the efficiency of both the navy and the army of Japan. There was really nothing to wonder at. Most of the reasons suggested for what had happened were, he held, entirely wrong. If the Japanese religion or the old Japanese civilisation had been in question, then China would have followed suit. What really had happened in Japan was that for the last thirty years everybody, from the Mikado to the smallest boy and girl, had been taught to think. They had been dealing with things as well as words in their schools, and they represented at the present moment the *maximum* of efficiency and brain-power as the result of that treatment. Mr. Chamberlain, Lord Rosebery, and others had referred to the great relative advance of the commerce and industry of Germany and the United States. He would again point out that these were examples of lands with complete and numerous State-aided universities. Surely it was more than a coincidence when we found in those lands the State service and all the national activities carried on in the full light of modern science by men who had received a complete training. If the guild helped us in any way to improve our national position in this respect it would not have been founded in vain, but there was certainly much for it to do along many lines.

The Bishop of Ripon moved the first resolution:—