

to be followed later by a complementary work on "Power House Design", which for many years were regarded as standard works.

All this time, Snell's virile brain envisaged a much wider sphere of activity, and as his advice on technical problems was sought with increasing frequency he took the plunge and established himself as a consultant in Westminster. His practice rapidly increased, and also his reputation as an expert witness, and as an authority on the rating of electricity undertakings. In 1910, he amalgamated his practice with that of Messrs. Preece and Cardew, the new firm being known as Preece, Cardew and Snell.

Perhaps Snell's outstanding achievement in these years was in connexion with the acquisition by the State of the telephone service. He was the principal technical witness for the Crown in the arbitration proceedings, and was in the witness-box for thirteen days. His case was prepared with that meticulous care and accuracy which distinguished him throughout his career, and as a result, he was largely instrumental in saving the country more than £8,000,000.

Snell received the honour of knighthood in 1914, and later, as a reward for further public services, he was created a G.B.E. in 1925. He was retained as electrical adviser to the Board of Trade on matters such as the regulations for the safety of the public. Owing to the growing importance of electric supply as a public utility, the Government of the day passed the Electricity (Supply) Act, 1919, for the reorganization of the industry, and placed the control in the hands of an independent body of experts known as the Electricity Commission. Snell was persuaded to accept the office of chairman (though at a considerable financial loss to himself), a position which he adorned until his retirement in January last.

In 1925, Snell was chief technical adviser to the Weir Committee, the recommendations of which were embodied in the Electricity (Supply) Act, 1926, which provided for the re-organization and co-ordination of electrical generation on national lines, under the direction of a new body, the Central Electricity Board, a function of which was to interconnect by means of the 'Grid' the most efficient power stations and close down the smaller and less efficient plants. The generating side of the industry being thus placed on a soundly organized basis, he turned his attention to the reorganization of the distribution side, envisaging the reduction of more than six hundred separate undertakings, which had grown up in somewhat haphazard fashion, to a much smaller number, by means of amalgamation or acquisition on fair terms. He was a member of the McGowan Committee which reported its conclusions to the Government in 1936. The Government has announced its intention of promoting legislation to this end.

The outstanding achievements of Snell's career may be summarized as (1) his work for the country in connexion with the acquisition of the telephones; (2) the reorganization of generation into one orderly whole and the establishment of the 'Grid'; (3) the unification of the frequency throughout the country to a standard of 50 cycles in place of various frequencies ranging from 25 to 100 cycles; (4) the

encouragement of a standard of A.C. voltage of 400/230 which, though not yet universal, is making encouraging progress; and (5) the encouragement to electrical undertakers to take long views—especially with reference to rural electrification.

Sir John Snell was president of the Institution of Electrical Engineers in 1914-15, and was awarded the Faraday Medal in March last, in recognition of his distinguished services to electrical science: vice-president of the Institution of Civil Engineers in 1926-31 and only ill-health prevented his accepting the presidency: past-president of the Incorporated Municipal Electrical Association in 1902-3: past-president of the British Electrical and Allied Industries Research Association in 1928-29: president of Section G (Engineering) of the British Association in 1926 (Oxford meeting).

Though it will be obvious that Snell's opportunities for recreation were scanty, he was keenly interested in the petrological study of rocks, particularly those of igneous and metamorphic origin. In late years he made a special study of the contact minerals associated with the aureole of metamorphism surrounding the Cornish granites. He was always a great bird lover, and in his younger days he used to tame various wild birds to come to the hand.

The present writer, who enjoyed his friendship for more than forty years, and who for a decade was in almost daily touch with him, would give the following impression of Sir John's character. He had the judicial mind to a marked degree. In his conduct as chairman of conferences and inquiries, he was always dignified, always fair, and those to whom he had to announce an adverse decision never doubted his integrity and impartiality. To all who came in contact with him, whatever their station in life, he showed a fine old-world courtesy.

T. P. WILMSHURST.

Mr. E. M. Nelson

By the death of Edward Milles Nelson on July 20, at the ripe age of eighty-seven years, a great microscopist has passed away. He was the son of a doctor, and after a brief period of study at Corpus Christi College, Cambridge, he entered the service of a telegraph company and was for a time engaged in laying submarine cables along the coast of South America, and between the Shetlands and the mainland. Even at this period, he was never so happy as when testing the performance and optical qualities of a telescope, sextant or other optical instrument.

Nelson afterwards settled in London, and in 1876 joined the Quekett Microscopical Club, of which he later became president for three successive years (1893-95), and contributed a number of papers to its *Journal*. He now devoted himself more and more to work with the microscope, being much more interested in the theory, construction and use of the optical parts of the instrument than in the objects examined. He had an acute controversy with Abbe respecting the proper conditions for obtaining the best performance of microscope objectives of high numerical aperture. Abbe maintained that a small

(pin-hole) stop in the substage condenser was the proper combination, whereas Nelson held that a large aplanatic cone is essential, and this was afterwards proved to be correct. His views on this subject were contributed in a paper to the *Journal of the Quekett Microscopical Club* (4, Ser. 2, 116; 1890).

Nelson was also a fellow of the Royal Microscopical Society, to the *Journal* of which he communicated some two hundred papers and notes between 1881 and 1914. He was likewise president of this Society for three years (1897-99).

Possessed of very keen eyesight and unlimited patience, Nelson by his method of 'critical illumination' demonstrated many structural details previously unknown in diatoms and other microscopic forms of life, and in 1882 exhibited at the Royal Microscopical Society. Nobert's 19th band resolved for the first time in England. He also devoted much time to photomicrography with conspicuous success, and contributed the fine series of photomicrographs which

illustrate the 1891 edition of "Carpenter on the Microscope", edited by Dallinger.

Nelson was also interested in the telescope, upon which he had privately published a little book in 1893, and he aroused the interest of Col. Gifford in this instrument, who, guided by Nelson, computed apochromatic telescope object glasses with very perfect corrections. The designing of mathematical scales and rules and the calculation of mathematical tables, with special reference to optics, were other subjects at which he worked. Nelson was also interested in ancient stone circles and made a considerable study of them, resulting in the publication of a small book on the subject, "The Cult of the Circle Builders".

In private life, Nelson was deeply religious and an admirer of classical culture in its proper sphere. He will be greatly missed by microscopists, for he was always ready to place his unrivalled knowledge and technique at the disposal of all—and they were many—who sought his help. R. T. HEWLETT.

News and Views

Sir Albert Seward, F.R.S.

By the election of Sir Albert Seward as president of the British Association for the meeting to be held in Dundee next year, botany again assumes the presidential dignity after a comparatively short interval, since Prof. F. O. Bower was president of the Bristol meeting in 1930. Sir Albert's work and influence have been, and still are, very widespread in scientific research and in guiding the destinies of science and academic administration. For thirty years (1906-36), he held the chair of botany at Cambridge, which, since his retirement, is being filled by one of his former students, Prof. F. T. Brooks. For some years before Sir Albert's election to the chair at Cambridge, he had been fellow and tutor at Emmanuel College, and for sixteen years, University lecturer in botany; so his connexion with Cambridge has been a very long one. During 1915-36, he was Master of Downing College, and in 1924-26 Vice-Chancellor of the University. Thus has he been able to play a large part in academic administration at Cambridge for which his scientific attainments and personal qualities were admirably suited. He is a fluent speaker with an exceptional fund of sharp humour. Most of Sir Albert's scientific work has been associated with palaeobotany, and his name is joined by botanists with those pioneers who were responsible for lifting botany from the stagnant condition in which it was in Great Britain several decades ago, to the very live condition in which it finds itself to-day.

SIR ALBERT'S palaeobotanical work has proved of inestimable value to present-day concepts of plant evolution and the distribution of plants in geological time. These researches have been published over a long period of years, and still continue. His more general works include the "Wealden Flora" and the

"Jurassic Flora", both in the British Museum Catalogue series, and "Fossil Plants and Tests of Climate". Students of botany and geology have for long been indebted to him for his "Fossil Plants for Students of Botany and Geology" in four volumes, while his more recent book "Plant Life Through the Ages" is a pattern of conciseness and clarity of style. His particular scientific interest in recent years has been the study of plants in past geological ages with particular reference to their distribution over the world and the indications they give of climate in geological time. But he has always fostered the study of botany in all its aspects and not merely as regards his own special interest. In more general fields, Sir Albert's influence has been even more profound. He was president of the International Botanical Congress held at Cambridge in 1930; president of the Geological Society of London in 1930, and president of Section K (Botany) of the British Association in 1903 and again in 1929. He has served on the Council of the British Association and was one of the local secretaries for the very successful Cambridge meeting of 1904. He was a vice-president of the recent Cambridge meeting. Since 1934 he has been foreign secretary and a vice-president of the Royal Society. During his academic career, and since his retirement, his work has received well-merited recognition from many sources. He is honorary member of most national academies and societies and was awarded a Royal Medal of the Royal Society in 1925, the Wollaston Medal of the Geological Society in 1930 and the Darwin Medal of the Royal Society in 1934. His influence and advice have not passed with his resignation, for he is now a trustee of the British Museum and a member of the Advisory Council of the Committee of the Privy Council for Scientific and Industrial Research. With