will mark a further stage in the development in Glasgow of first-class facilities for the training of veterinary practitioners.

Indeed, the new buildings which were inaugurated on March 19 represent for the University as a whole merely a stage of development rather than the fruition of its plans. Much still remains to be done. The temporary buildings for the Department of Chemistry which were in use for half a century are now being demolished, and soon the site will be clear for an extension of the engineering departments. This extension is estimated to cost £600,000 without equipment and, of this, industry has contributed £220,000. A new building has been planned for some of the arts departments, and it is hoped that a start will be made within a very few years. In their turn will come also student residences (only one University has a smaller proportion of its students in halls of residence than has Glasgow), a new University Library and a larger provision for some of the medical and biological departments. When this second stage is complete, the worst of the post-war shortages of accommodation will have been remedied. What the third stage will comprise must be left for future decision. Those who will be responsible for deciding will be greatly helped by the master-plan of University development drawn up a few years ago by the late Sir Frank Mears.

OBITUARIES

Prof. A. B. Dobrowolski

Antoni B. Dobrowolski, Polish meteorologist and hydrologist, whose death has been recently announced, was born in 1872. Like most of his scientifically minded countrymen of that period, he had to turn to the West for his education—in his case to Zurich and Liège. In 1897 Belgium was entering the field of Antarctic exploration, and Henryk Arctowski and Dobrowolski joined the scientific staff of the *Belgica* expedition under the leadership of A. de Gerlache de Gomery with Roald Amundsen as first mate. The ship got stuck in the ice in the west of the Bellinghausen Sea near lat. 70½° S., long. 86° W. at the beginning of the southern winter of 1898. It had perforce to spend the winter there, and so the expedition became the first to take regular meteorological observations and maintain continuous autographic records of pressure and temperature in one part of the Antarctic over a complete year, though not without much hardship and suffering.

Dobrowolski concentrated on the observations of the forms and motions of clouds and on the observation and description of the different forms of snow and ice in the atmosphere. In his treatment of the former he broke new ground in his description of the 'cloud system' and his emphasis on its importance in meteorology. A 'cloud system' covers a large area, and the form of cloud in any part of the system depends on its relative position. Some twenty years after the publication of Dobrowolski's memoir, the significance of these cloud systems, largely owing to their study by French meteorologists, had a profound influence on the work of the International Commission for Synoptic Meteorology and afterwards on the international classification of clouds. Dobrowolski's observations of the motion of clouds were utilized by Simpson in his construction of the pressure distribution at a height of 3,000 m. over the Antarctic; the *Belgica*, the *Gauss*, the South Orkneys and *Erebus* provided a ring of nearly equally spaced observations near lat. 70° S.

F. M. Exner paid a warm tribute to the care and accuracy of Dobrowolski's descriptions of the observed forms of snow and ice crystals when he used them in his revision of the theory of halo phenomena in Pernter–Exner's "Meteorological Optics". Dobrowolski himself maintained that the crystals effective in producing halos were probably the holohedric hexagonal 'columns' and the hemimorphic prisms with an attached plate, because these would tend to float with their axes in one direction, and that simple plates and needles could be practically excluded from consideration as halo formers.

Ice in its manifold forms became, indeed, Dobrowolski's main subject. He wrote a comprehensive treatise, "The Natural History of Ice", published in 1923 under the auspices of the Polish Institute for the Advancement of Science. It was an encyclopædic work of international repute and should have been, as its author desired, in an 'international language'. But it had to be in Polish because the pre-1914 founders of the Institute, desirous of banning the Russian language, had made a rule forbidding all languages other than Polish as the only way, then permissible, of securing their object.

Dobrowolski was director of the Polish National Meteorological Institute during 1924–29. Thereafter, conscious of the dependence of hydrology on meteorology, he sought support at international meetings for his thesis that the meteorological and hydrological services in each country should be united under one head, to secure the close collaboration of which the need was self-evident. He also pressed for the formation of an Association of Cryology in the International Union of Geodesy and Geophysics to replace the Snow and Ice Commission of the Hydrology Association. E. Gold

Colonel L. J. Hudleston

Lawson John Hudleston, who died on April 25, was born on May 8, 1891, and was educated at University College School, and University College, London, where he graduated in 1913. His post-graduate research was soon interrupted by the First World War; holding a Special Reserve Commission, he served with the 1st Middlesex Regiment through the retreat from Mons, was mentioned in dispatches and awarded the Military Cross in 1915. He was transferred to the Ministry of Munitions in 1917 and worked on the synthesis of ammonia until the end of the War; then, as Salters Fellow, he was with Prof. H. Bassett at Reading for a year.

In January 1920 he was appointed lecturer at the University College of Wales, and he settled down in Aberystwyth, marrying Miss Mabyn Thompson, of the Zoology Department, who, with one daughter, survives him; he had been senior lecturer in the Chemistry Department for many years at the time of his death. Persuaded to take command of the Aberystwyth T.A. Battery in 1936, he was in command of the Cardiganshire Field Regiment, R.A., in 1939, and again served throughout the War, during the latter half of it on the staff of the Scientific Adviser to the Army Council. Here his flair and enthusiasm for applying scientific method to novel problems was of great value, and he did important

work on the control of artillery bombardments, and also in getting the scientific approach to such problems appreciated by the fighting units. He was in charge of operational research with the army during its advance through Italy.

Hudleston was the author of "Chemical Affinity" (1928) and numerous papers in the *Journal of the Chemical Society* and the *Transactions of the Faraday Society*. His main interests were in the complex chemistry of fluorides and fluosilicates, and in the theory of the liquid state.

He was also deeply interested in teaching methods, and was held in the highest regard by his students and colleagues. He continued to give whole-hearted service to the community, as well as to the College, after the Second World War; he was chief technical reconnaissance officer in the Cardiganshire Civil Defence organization, and was on a Civil Defence course at the time of his last illness.

C. W. Davies

Dr. Frank Wenner

Dr. Frank Wenner, for many years chief of the section devoted to resistance measurement at the National Bureau of Standards, Washington, died on February 7 at the ripe age of eighty-one. The early years of his scientific career were spent in various teaching posts, first at Knox College where he had graduated in 1895, and afterwards at the University of Wisconsin, Iowa State College, and the University of Pennsylvania. He then joined the staff of the National Bureau of Standards, and for thirty-six years worked on problems centring around the precision measurement of electrical resistance. It was fitting that this work should culminate in a new absolute determination of the ohm. The project was started by Wenner in 1929, and a provisional result was submitted in 1938 to the international committee then engaged in making the transition from the old international unit, based on the standard column of mercury, to the absolute unit. Later, the method was more fully developed by Thomas, Peterson, Cooter and Kotter, who, on publishing the final result in 1949, expressed the opinion that the Wenner method is "the best yet devised". It is undoubtedly one of the very few methods that will survive in the future practice of the national standardizing laboratories.

Wenner was also interested in geophysics and developed an electrical seismometer, for which he was awarded the Wetherill Medal of the Franklin Institute, and a method used by the Iceberg Patrol of the U.S. Coast Guard for measuring the salinity of sea water.

After his retirement from the National Bureau of Standards in 1943, he continued to work as a consultant to various organizations, and he was still active in consulting work at the Bureau when a stroke caused his death.

L. Hartshorn

NEWS and VIEWS

Charles Algernon Parsons (1854–1931)

Sir Charles Algernon Parsons, engineer, inventor and scientist, whose researches revolutionized electric power-station practice and marine propulsion throughout the world, was born in London a century ago on June 13, 1854. He was educated privately and at Trinity College, Dublin, where his father, the distinguished astronomer William Parsons, third Earl of Rosse, had been chancellor. After studying mathematics under E. J. Routh at St. John's College, Cambridge, and passing out as eleventh Wrangler in 1877, he began his engineering training with a four years apprenticeship in the Armstrong Works at Elswick. During 1884–89 he was junior partner in Clarke, Chapman and Co., of Gateshead, where on April 23, 1884, he took out his first patent for the compound steam turbine, which he rendered suitable for the generation of electricity and afterwards for the propulsion of vessels. The *Mauretania* and *Lusitania* were the first great ships propelled by Parsons's turbine. In 1889 he founded at Heaton, near Newcastle upon Tyne, C. A. Parsons and Co., where he manufactured parabolic reflectors for searchlights. His growing interest in optics led him to purchase the Derby Crown Glass Works. His British patents number more than three hundred and include an improved variety of gramophone and a non-skid device for motor tyres. His attempt to make diamonds proved a failure. Many honours came his way, including a K.C.B. in 1911 and the O.M. in 1927. He was elected to the Royal Society in 1898, receiving the Rumford Medal in 1902 and the Copley Medal in 1928, and served as president of the British Association in 1919. He died on a voyage to the West Indies on February 11, 1931. Parsons was a tremendous worker with remarkable powers of concentration, being a keen, critical observer, and all his life he was a firm believer in the importance of research in industry. As a person, he was modest and gentle, and hesitant in manner and speech.

Electrical Engineering in Nottingham: Prof. H. Cotton, M.B.E.

Prof. H. Cotton, who retires from the chair of electrical engineering in the University of Nottingham on September 30 next, studied physics and electrical engineering in the University of Manchester, where he graduated with first-class honours in 1910. He then obtained practical experience at the Municipal Electric Power Station, Hanley, and with the Westinghouse Co. (now Metropolitan-Vickers Electrical Co., Ltd.) at Trafford Park. From the outset he intended to enter the teaching profession, and he was appointed assistant lecturer in physics and electrical engineering at the Technical College, Huddersfield; later he became lecturer at the Technical College, St. Helens. During the First World War he served in France for three years with the Meteorological Section R.E.; he was awarded the M.B.E. (Military Division) and commissioned in the field. Following demobilization in 1919, he was appointed senior lecturer in electrical engineering at the then University College, Nottingham. Here it was necessary to build up a department literally from ground-level. At first he had to bear the whole of the teaching for the external degree course of the University of London, for special courses in mining electrical engineering, for day and evening courses. The work in mining engineering necessitated a special study of the applications of electricity to coal mining, and he published a standard treatise on the subject "Electricity Applied to Mining" in 1929. For some