lections; here, as in Cardiff, lack of funds precludes more rapid progress.

Space will not permit a detailed description of the growth of the five departments housed in Cardiff. Suffice it to say that the aim has been to meet, in the first place, the needs of the casual visitor, by means of planned and attractive exhibits, designed to be of general interest. At the same time, collections have been amassed which are capable of satisfying the requirements of students and research workers, partly through the generosity of private collectors and donors, partly from expeditions and excavations sponsored by the Departments themselves.

Such expeditions are not the only contacts which the Museum has beyond its own boundaries. The Turner House, Penarth, erected by James Pyke Thompson in 1888, in order to share his collection of pictures with the public, was transferred to the Museum by his trustees in 1921, for use as a branch art gallery, and now houses a constantly changing succession of loan and travelling exhibitions. A still older collection merged with the National Museum when, in 1930, at the invitation of the Monmouthshire and Caerleon Antiquarian Society, responsibility was accepted for the museum at Caerleon, built in 1850 to house local antiquities, and in which it now shares with the archaeological galleries at Cardiff the fruits of the excavations of the legionary fortress in which the Museum has had a constant interest over many years, as it has also had in excavation elsewhere in Wales.

In two further ways, the Museum, its staff and its contents are becoming known throughout the Principality. In 1922, a scheme of affiliation was inaugurated for the smaller museums which are scattered throughout Wales. The first of its kind in the British Isles, its benefits may be seen in almost every county in Wales.

Not content, however, with making its services available to other similar institutions in Wales, in 1949, with the financial assistance of local education authorities, the Museum Schools Service was inaugurated, to provide for the extension of the hitherto restricted services available to schools in Wales. With the active support of every authority,

the Service has grown in a short time to include an officer in each of the five Departments in Cardiff, with some three thousand portable exhibits being distributed to schools throughout Wales every term. Arrangements are also made for the reception and guidance of school parties at the Museum, and it is gratifying that the number of these parties is growing every year.

The Museum's collections have been enriched by many generous gifts and benefactions: the extent of this debt can never be accurately measured. Space will, however, only permit mention of one, itself of such distinction that it transformed the Department of Art into a gallery of international importance. This was the bequest of Miss Gwendoline Davies of her notable collection of pictures, drawings and sculpture. Particularly strong in the paintings of the nineteenth century in France, it also includes notable works of all ages from Botticelli to Augustus John.

Of all the objects envisaged by the charter, one only remains to be realized: a department to illustrate the industries of Wales and their impact on its life, both yesterday and to-day. In recent years the Treasury has been asked for the funds necessary to start such a department, but has so far been unable to make them available. Only when a Department of Industry is created will the terms of the charter be fully implemented, and all the reasonable requirements of the public be met.

Much, of course, remains to be done elsewhere. The building in Cardiff is only half-complete; development at St. Fagans must be maintained if the Folk Museum's objective of preserving as much as possible of the buildings and the environment of Welsh life, both past and present, is to be achieved. During the past fifty years, growth and development have been constant and steady. The Museum is prepared for the future in every respect but that of finance, where, in common with the majority of museums in the British Isles, the position causes the gravest misgivings. But, whatever may be in store, we can be sure that with the loyal service we have come to expect from the staff, and the continued assistance of so many throughout Wales, the Museum can look forward with confidence to the future.

OBITUARY

Prof. Henry Norris Russell, For.Mem.R.S.

HENRY NORRIS RUSSELL, whose death at Princeton after a long illness was reported in February, was born at Oyster Bay, New York State, on October 25, 1877. He graduated Ph.D. at Princeton University in 1900, and in 1903 he went to King's College, Cambridge, as a research assistant of the Carnegie Institution; he worked on photographic stellar parallaxes with A. R. Hinks at the Cambridge University Observatory. On returning to Princeton he held various minor posts there; in 1911 he became professor of astronomy at Princeton, and in the following year director of the University Observatory, a post he held until 1947. In 1927, by which time he had established his position as one of the foremost theoretical astrophysicists in the world, he was appointed research professor of astronomy; at the same time he was made a research associate of the

Mount Wilson Observatory. He resigned his chair in 1947 and was then made research associate of the Lick and Harvard Observatories.

As early as 1912 Russell began publishing papers on eclipsing binary stars, a subject which was to interest him all his life. His last few published papers were devoted to eclipsing binaries, and one on "Eclipsing Variables in the Magellanic Clouds" was published in "Vistas in Astronomy" (Vol. 2) only a week before his death. His early work also included studies of the orbits of spectroscopic binaries and of the origins of binary stars. His work on stellar evolution, remembered everywhere in the Russell-Hertzsprung diagram, gained for him the Gold Medal of the Royal Astronomical Society in 1921. Russell next became interested in ionization in solar and stellar atmospheres and in spectroscopic problems linked with multiplets and series in atomic spectra, with special reference in iron and titanium. Improve-

ments in multiplet notation and the Russell-Saunders coupling are abiding results from his work in this field.

Russell was also working actively on the composition of the solar atmosphere, on the pressures at the Sun's surface and on the principles to be employed in the analysis of stellar spectra. He was concerned along with others in stellar classification, in spectroscopic and trigonometrical parallaxes and in the calibration of Rowland's scale of intensities in the solar spectrum. The width of his interests is indicated by the fact that he served on no less than eleven commissions of the International Astronomical Union; he was president for several terms of the Commission on Stellar Spectra and later of the Commission on the Constitution of the Stars. Up to some fourteen years ago he was actively contributing important papers on a wide range of astrophysical subjects; in his latest papers he reverted to his early interest in eclipsing binaries.

In addition to his many scientific papers, he published books on "Stellar Parallaxes", "The Solar

System and its Origin", "The Masses of Stars", "Fate and Freedom", and in 1926 (with R. S. Dugan and J. Q. Stewart) a text-book on astronomy which has been for years the standard work on the subject. His researches were recognized by many awards. In his own country he was given the Henry Draper Medal (1922), the Bruce Medal and the Rumford Medal (1925) and the Franklin Medal (1934). France awarded him the Lalande Prize in 1922 and the Janssen Medal in 1936. He was elected an associate of the Royal Astronomical Society in 1916, foreign member of the Royal Society in 1937, a corresponding member of the Paris Academy of Sciences in 1939 and an honorary member of a number of other foreign academies. He was elected an Honorary Fellow of King's College, Cambridge, in 1941. He was president of the American Association for the Advancement of Science in 1933. A man of overflowing energy, never sparing himself in his own work or in assisting the researches of others, he was the most eminent and versatile theoretical astrophysicist in the United States, if not in the world. F. J. M. STRATTON

NEWS and VIEWS

Mechanical Engineering at University College, London: Prof. B. J. Lloyd-Evans

PROF. B. J. LLOYD-EVANS is to retire at the end of this session from the Kennedy chair of mechanical engineering at University College, London—a post which he has occupied since the retirement of the late Prof. G. T. R. Hill in 1948. His long and devoted service to the Mechanical Engineering Department dates back thirty-seven years, during which time he has lectured mainly on applied thermodynamics and hydraulics, and has been in charge of the workshop and mechanical engineering laboratories. Dr. Lloyd-Evans is an honours graduate of the University of London. Among his duties when first appointed as senior lecturer under the late Prof. E. G. Coker were the extension and reorganization of the workshop and the establishment and equipment of the Hawksley hydraulics laboratory. He acted as head of the Department during the War period when the Faculty of Engineering was evacuated to Swansea. After the return to London a considerable programme of modernization of equipment had to be undertaken. In spite of the heavy demands upon his time made by teaching and routine, he has carried out a good deal of original research. One of his subjects was the extinction pyrometer technique for measurement of flame temperature in internal combustion engines, while, in conjunction with the Physics Department of the College, he worked on the development of high intensity electromagnets. Throughout his career, Dr. Lloyd-Evans has been distinguished for his ability as a teacher, his personal interest in his students and his friendliness with those who have been privileged to work with him.

Dr. R. E. D. Bishop

DR. R. E. D. BISHOP, lecturer in engineering at the University of Cambridge, has been appointed to succeed Prof. Lloyd-Evans. Dr. Bishop served during the latter part of the Second World War in the Royal Navy and entered University College, London, in 1946 under the Further Education and

Training Scheme. He read mechanical engineering and took a first-class honours degree, the Diploma of the College (with distinction) and was awarded the Head Memorial Medal and Prize. Between 1949 and 1951 he held a Commonwealth Fellowship at Stanford University for study under Profs. J. N. Goodier and S. P. Timoshenko, and, while there, conducted research on elastic wave propagation. An appointment to a demonstratorship in engineering took Dr. Bishop to Cambridge in 1952. He was made university lecturer in 1955, having been admitted to a fellowship of Pembroke College in 1954. The Stanford school is specially strong in applied mechanics and, while there, Dr. Bishop became particularly interested in its various branches. He has since worked in this field, paying particular attention to the general wave motions of elastic bodies and, more recently, mechanical vibration. In the early stages of this latter work he collaborated at Cambridge with D. C. Johnson before his move to Leeds as professor of mechanical engineering. A book of vibration analysis tables recently appeared under their names and its preface states that they are producing a second book together. Dr. Bishop is a member of the Applied Mechanics Committee of the Institution of Mechanical Engineers.

Building Science at Liverpool:

Prof. A. W. Hendry

MORE engineers and others with scientific training should be encouraged to enter the building industry, and more than a veneer of science is needed in architectural courses. The University of Liverpool, which has a strong Faculty of Engineering and School of Architecture, as well as a special section of the Department of Physics which deals with acoustics, has therefore created a new chair of building science. Prof. A. W. Hendry is to be the first holder of this chair. He initially graduated in the University of Aberdeen. After gaining practical experience with Sir William Arrol and Co., Ltd., Glasgow, he returned to lecture at Aberdeen for six years. For two further