In the summer of 1951 twenty-two parties of biologists were at work in the Kara Kum desert. Each expedition comprised twelve to twenty persons—zoologists, botanists, soil experts and others coming from all over the Soviet Union. Collections of fauna and flora, ecological studies and soil analyses are being made by the expeditions, and particular attention is being paid to the life-cycles of parasites, and possible pests of the new plantations. The young Academies of Sciences in the Central Asian States are taking an active part in their regional economic developments.

The oasis of modern Tashkent is a hygienic city surrounded by farmland with a population of 1,300,000. In 1918 there was no general education, scarcely any medical service, the women were veiled and lacking in social rights, and there was no modern industry. To-day hydroelectric power supplies great industries, and modern buildings in an eastern style are replacing the mud-brick dwellings. "Othello" was being presented in Uzbek in one of the theatres and "Madame Butterfly" in the Opera House. The latter was completed in 1946. I was invited to spend an hour and a half viewing the public parts of this edifice, and it is one of the most beautiful buildings I have ever seen. The emancipation of the women of Uzbekistan is complete, all the children go to school, and there is a university both at Tashkent and Samarkand.

Such advancement has made possible the development of scientific work by the Uzbek and other races. The Uzbekistan Academy of Sciences in Tashkent, housed in a spacious building, integrates the activities of twenty-three research institutes. A visit to the Zoological Institute disclosed a large building with several floors, situated in its own grounds, in which work most of the sixty full-time research zoologists of Tashkent, that is, additional to those zoologists teaching in the University. Many of the zoologists were away on expeditions, some had just returned, and they discussed their work with me. The building contained a sufficiency of apparatus, with a biochemical laboratory and dark-rooms with photomicrographical apparatus. One room was filled with cultures of soil micro-organisms. The economic problems and work connected with the irrigation of Turkmenia and Uzbekistan are engaging most attention at present, and the results of this work are being published in Uzbek journals as well as in those of Russia.

The diversion of so much water from the Volga and the Amu Darya on to the land will lead to a reduction in level of the Caspian and Aral Seas, and if nothing is done an appreciable increase in salinity will occur by 1970. The magnitude of the present construction projects dwarfs anything hitherto undertaken by mankind; but only part of the potentially fertile land in central Asia will be watered. Plans are already under consideration for the diversion of some of the abundance of water flowing into the Arctic seas from the Ob and the Yenisei. The flow on these rivers is more than three times as great as that of the Volga, and much of this water could be diverted to Central Asia by dams, canals and existing dry-river valleys. The Aral Sea could become fresh, and there would be an abundance of water for the Central Asian States.

The new University of Moscow, standing on the Lenin Hills, is a conspicuous landmark visible from the south before any other feature of the city is discernible. This building, which will serve the

advancement of science, is symbolic of parallel facilities elsewhere. The University, the towns which are already rebuilt and the great construction projects are clearly designs for peace, and with the medical services, which lead the world in the appreciation of preventive principles*, must represent a very large proportion of the national effort. A fuller account of these and other aspects of my visit will be found in a forthcoming book, "The Soviet Union Today, a Scientist's Impressions".

* See a forthcoming report by Dr. H. Joules *et al.*

OBITUARIES

Prof. N. V. Sidgwick, C.B.E., F.R.S.

NEVIL VINCENT SIDGWICK was born in Oxford on May 8, 1873, the eldest son of William Carr Sidgwick, Fellow of Merton; after his early education at Rugby he went to Christ Church as a scholar in natural science, where, having worked three years under Vernon Harcourt, he took a first in chemistry, following this two years later with a first in Greats—a noteworthy feat. He then worked under Ostwald in Leipzig and with H. von Pechmann in Tübingen, leaving with an Sc.D. of the highest class to return to Oxford in 1901 as Fellow and Tutor of Lincoln College.

For a few years his interests were almost wholly in Oxford, where he followed a rigid routine. Every occupation had its allotted periods, and even his engagements with walking or golfing partners were made for a whole term at a time. His name first became generally known on the publication of his "Organic Chemistry of Nitrogen" in 1910—a book so outstanding in matter and style as to attract attention and praise from all quarters. Personal contacts made during a visit to Australia with the British Association in 1914, and in the course of conspicuously successful work on diverse problems for the Department of Explosives Supply during the First World War, paved the way to a less cloistered life. After the War, he began to take part in the work of scientific societies, sought the acquaintance of eminent British and foreign men of science and, induced by the marriages of pupils and colleagues to break his earlier habit of avoiding any but male society, entered into intimate family friendships, highly valued by both sides.

Sidgwick's researches in the period 1907–20, on rates of reaction, and on the variation of the physical properties of isomeric benzene derivatives with the positions of the substituting groups, followed the usual lines of such work. But in 1920, his mind was so profoundly influenced by the interpretation of the Periodic Classification reached independently by Bohr and by Bury on the basis of the Rutherford-Bohr atomic model that the direction of all his further work was determined. This advance, it was generally realized, opened up the prospect of a rationalization of chemical theory; it was Sidgwick's great merit that he was foremost in turning the prospect into a reality. Few scientific books in modern times can have had such a vitalizing effect as his "Electronic Theory of Valency", published in 1927. This he followed up with intensive studies of the properties directly dependent on the nature of the chemical bond—atomic radii, dipole moments, bond-strengths, valency angles and configurations—writing and lecturing on these subjects with such

force and lucidity that on all he was regarded as authoritative. His Baker Lectures delivered at Cornell, published in 1933 as "The Covalent Link in Chemistry", amplified some of his original ideas. His last and greatest work—no less than the reconsideration of the whole of descriptive chemistry not specifically organic, in terms of modern theory—was published in 1950 as "The Chemical Elements and their Compounds". This, in fact, is the "second volume" projected in his preface to the "Electronic Theory of Valency". It was characteristic of Sidgwick that, despite the magnitude of the task, the distraction of the war years, and the physical disabilities that overtook him, he completed his original plan.

Inevitably, Sidgwick was drawn into the work of important committees and called to high office. At various times he was chairman of the Chemistry Research Board of the Department of Scientific and Industrial Research; chairman of the Publication Committee of the Chemical Society; president of the Faraday Society; president of the Chemical Society; and vice-president of the Royal Society. In Oxford he became successively reader and professor, was a member of the Delegacies for the Clarendon Press and the Bodleian Library, and worked indefatigably for the development of scientific studies. In his work as a teacher, his pupils in Lincoln College naturally took first place; but through informal and easy contacts with men from all colleges, in the laboratories and in the Alembic Club, he became almost a 'Father in Chemistry' to the whole Chemistry School—strict, but not severe, and to be counted upon for help or advice.

Sidgwick was superbly equipped with an acute and penetrating intellect, a memory for many years infallible and a command of apt and elegant language. But even more than these great gifts, it was his intellectual integrity, his life-long refusal to be content with anything but the best, that moved men everywhere to admire and trust him. On any subject, at any time, Sidgwick wrote or said exactly what he thought, in language admitting of no doubt. If, at times, he was caustic in censure or disapproval, his criticisms seldom caused more than passing resentment, so obviously did they arise from his zeal for truth and efficiency. He loved good talk; his own—a unique blend of knowledge and wisdom, wit and anecdote—delighted his company, and stimulated response. He was at his most genial, perhaps, in the Common Room at Lincoln or as host in his own rooms; hospitality, for which the amenities of his College gave such excellent facilities, was one of his greatest pleasures.

Sidgwick travelled widely, but after his tenure of the Baker Lectureship at Cornell University in 1931, where he was delighted with the cordiality of his reception, he returned again and again to the United States. He made friends in universities and research institutions all over the country, many of whom, when they came to Britain, were his welcome guests in Oxford. No man did more than he to promote understanding and friendship between American and British men of science. His visit to the United States in 1951, which, notwithstanding physical disabilities, gave him keen pleasure, was, in fact, his last activity.

Sidgwick lived a full life in the surroundings he most loved; he finished the work to which he had set his hand, and received the rewards he most desired. Not all our thoughts on his death need be sorrowful.

T. S. MOORE

Sir Leonard Hill, F.R.S.

SIR LEONARD HILL, physiologist, scientist, writer and artist, died peacefully in his sleep on Sunday, March 30, in his home at Corton, near Lowestoft, in his eighty-sixth year.

Leonard Erskine Hill was born on June 2, 1866, and was educated at Haileybury and University College, London. He qualified in medicine in 1889 and received his London M.B. in 1890. After studying under Sir Edward Schafer he taught at University College, London, and later became professor of physiology in the London Hospital Medical School.

Hill's approach to physiology was always such as to establish immediate connexion between phenomena in the cells, muscles, or organs under investigation and the entire living body—his physiology was essentially 'applied'; and applied to the unusual extent in being carried on from the man into his working environment. The environment was in due course to be subjected to physical modifications requisite for the well-being of the man. In this way Leonard Hill may be said to have been the pioneer of health engineering, a profession now recognized in the United States of America.

Hill's wide knowledge, added to his insight into physical and mechanical process in non-living material, gave him an inventive genius of no mean order. He invented the sphygmomanometer independently and almost simultaneously with Riva-Rocci and was only forestalled in prior publication by mere chance. He was one of the pioneers in the physiology of man when working in air under pressure and in the study of the hazards encountered by men when working in diving dress or in caissons. Hill may be credited with the control of caisson disease ('bends') from which divers suffer, by introducing methods of decompression and recompression for these men when coming to the surface from great depths; and he also advocated that divers should perform muscular movements during decompression to assist the liberation of nitrogen from the blood stream.

Afterwards, and while director of applied physiology in the National Institute for Medical Research, Hampstead, Hill became actively interested in the theory and practice of ventilation. In a classical experiment carried out at the London Hospital (when seven medical students were confined in a telephone box), he finally disproved the theory that subtle organic poisons are given off with expired air. Hill's thesis, now universally accepted, that the discomforts and disabilities arising from bad ventilation are more often due to physical causes than chemical resulted in the development of the katha-thermometer and a wide application of its use in field investigations of all kinds. These studies were summarized in Medical Research Council publications on "The Science of Ventilation and Open Air Treatment", Parts I and II, and later "The Katha-Thermometer in Studies of Body Heat and Efficiency"; their application has ranged from factories to ocean liners.

With the late Dr. J. Argyll Campbell and others of a team, Hill made a number of investigations into sweat-loss, pulse-rate and other physiological changes in function resulting from high temperatures associated with changes in humidity and air movement in a wind-tunnel. This hot wind-tunnel contained a running platform on which subjects could be made to run at fifteen miles an hour.