

years' useful work. When descending a well shaft to examine the rocks through which it had been dug, he fell some 70 feet and was very seriously injured. The two remarks he is reported to have made when he recovered consciousness are perhaps as characteristic as anything he ever said. His first was: "It was, I assure you, solely my own fault. No one else is to blame." Then, turning to the unfortunate officer in charge of the winch: "You let me down so fast that I was unable to make out the sequence of the strata as I went past."

After his recovery, David was attached as chief geologist to General Headquarters and there he remained until the Armistice, one of his duties, which caused him a deal of quiet amusement, being the location of underground workings to protect the General Staff from bombs. He returned to Australia in 1919, and the next news his friends in Europe had of him was that he had departed on camel-back on an expedition to Central Australia in company with another veteran geologist, Howchin, of the University of Adelaide, who must then have been more than seventy years of age.

The last years of David's life were shadowed to some extent by illness, by the controversy that arose over his claim to have discovered pre-Cambrian fossils, and by his failure to complete his last self-imposed task, the preparation and publication of a comprehensive account of Australian geology, which was the main preoccupation of the years after his retirement from the headship of his Department in 1924. In 1932 he fortunately published a geological map of Australia with a volume of notes as an instalment of the great work, which he was himself beginning by then to fear he had commenced too late. Two days before the announcement of his death, the present writer received a letter concerning a projected visit to Cambridge in the winter, when he hoped to spend some months at Clare, the college of his adoption there, completing his book, so that he was, as he would have wished, in harness to the very last. His country, the scientific world and a host of friends are the poorer by his death.

R. E. P.

PROF. C. O. JENSEN

PROF. CARL OLUF JENSEN, who died on September 3 at the age of seventy years, was professor of pathology and director of the Serum Laboratory of the Danish Agricultural and Veterinary School, Copenhagen. He was chiefly honoured, and will be best remembered, as the author of two classical papers in cancer research—the first in 1903 on the experimental propagation of an alveolar carcinoma of the mouse, and the second in 1909 on transmissible rat tumours.

Although the transmission of rodent new growths had previously been achieved by Moreau, Hanau, and L. Loeb, Jensen's researches are rightly regarded as the beginning of modern experimental cancer research. He showed that the new tumours arose from the intact cells inoculated, and not by a transformation of the tissues of the new host. He further investigated the conditions for survival of tumour

cells outside the body, proving that successful transmission could be obtained with tumour material after three weeks' sojourn in the ice-chest. The prompt and complete confirmation of his results by Bashford and myself no doubt assisted the general recognition of the advance made by Jensen, but its fundamental nature was really established by Jensen's own work and by his free and wide distribution of tumour material. The award of the Walker Prize of the Royal College of Surgeons in 1906 was made in recognition of the value of these researches.

The transmissible rat sarcomas which formed the subject of Jensen's second paper are better known and have been propagated and used for investigation in every cancer laboratory in the world, but the remarkable circumstances of their origin have either been forgotten or ignored. They arose in two rats inoculated intraperitoneally with cultures of an acid-fast bacillus, a remarkable and unexplained observation which has never been repeated.

Jensen's only other contribution to tumour problems dealt with the transmissible tumours of the turnip and beet, later shown by Erwin Smith to be due to a microbe (*B. tumefaciens*) and now familiar as crown-gall.

In later years, administrative duties in connexion with Denmark's paramount agricultural industry absorbed so much of Jensen's time and energies that cancer research was perforce relegated to the background. His fame is secure and his memory will be cherished as long as men busy themselves with the fascinating problems of cancer.

J. A. MURRAY.

WE regret to record the death on September 24, at the age of seventy-seven years, of Mr. C. Carus-Wilson, who will be remembered for his investigation of the phenomenon of 'singing sands'. So long ago as 1888, Mr. Carus-Wilson read a paper before the Bournemouth Natural Science Society in which he ascribed the production of sound by certain sands to the rubbing together of myriads of very smooth grains of quartz. In NATURE of August 6, 1891, he described further experiments in which he succeeded in producing musical notes from appropriate sands in vessels of various shapes and sizes. He was able to show that Eigg sand in particular is musical in any vessel, whereas other 'singing sands', such as those of Studland Bay, emit sound only in highly glazed vessels of particular shape. A process of sifting, washing and boiling was also used to improve the emitting power of poorly musical sand. Mr. Carus-Wilson was a successful lecturer and writer on geological and other science subjects.

WE regret to announce the following deaths:

Sir John Adams, from 1902 until 1922 professor of education in the University of London and principal of the London Day Training College, on September 30, aged seventy-seven years.

Prof. Adalbert Fernau, director of the Institute for Radium Technology at Vienna, on August 30, aged fifty-six years.