

means of ingress to the antitubercular field. In adding to such approaches, many physical methods of controlling yeast and bacterial growth in the brewery have still to be explored. Ultra-violet sterilization has not been without success; ultrasonic treatment may be of value in this way as well as in rapid 'conditioning' (so far as protein precipitation is concerned), and cathode-ray treatment, now receiving intensive examination in processing foods, may provide another sterilization treatment lacking the disadvantages of pasteurization.

Turning more particularly to some aspects of brewery fermentation, only very recently has there become available even a partial view of the carbohydrates and of the amino-acids and other nitrogenous constituents of brewers' wort, as well as of their value as yeast nutrients and substrates. A brewery yeast, however, must obviously effect a composite fermentation, and in studying the component parts the National Collection of Yeast Cultures, which will be a responsibility of the Brewing Industry Research Foundation, seems likely in many instances to play an important part. Subsidiary collections of brewers' yeasts and of genetically pure and hybrid yeasts should have a peculiar research interest. The hybridization of yeast has only recently been intensively studied, mainly by Winge and his associates, who have provided much of the available data on the sporing and on the haplo- and diplo-phases of certain species of *Saccharomyces*. This work has proved valuable in the selection of hybrids for simple fermentation yeasts, but its exploitation in the brewery has hitherto been less marked. Such exploitation is, however, brought nearer by recent work of Thorne, who has succeeded in hybridizing several British top-fermentation brewery yeasts. Selection of the hybrids reveals that flocculence is a genetically controlled character. The observed segregation of the readily mutating hybrids makes it appear that not less than three genes are concerned with the appearance of flocculence, while still another seems concerned with inhibiting the expression of flocculence.

There are innumerable other points at which microbiology touches brewing. These range from the use of insecticidal washes in hop culture to the importance of wild yeasts in brewery casks, from the disposal of potentially toxic materials by yeasts to the formation of valuable vitamins. These are but a few of the problems which research in the not too distant future should do much to answer.

OBITUARIES

Mr. J. W. Tutcher

By the death, on April 11, of John William Tutcher, in his ninety-third year, geology has lost one of its outstanding amateur workers. He will be remembered particularly for his many contributions to the study of the palaeontology and stratigraphy of the Jurassic rocks of the Bristol district, and for his pioneer work in scientific photography.

Until recent years Mr. Tutcher carried on business as a bootmaker in Bristol; but most of his leisure was devoted to geology. In his younger days this frequently involved cycling out before business hours to the quarries of Dundry Hill and, when some particularly interesting bed was being uncovered, walking back with his cycle loaded with specimens.

When his own lameness is borne in mind, one could only marvel at his success in bringing together and preparing the collections which overflowed into all parts of his home. Apart from numerous specimens which found their way into other museums, the Bristol City Museum has more than 20,000 fossils from the Tutcher Collection, all with details of locality and precise horizon. At all times his specimens were placed at the disposal of other geologists, and many younger geologists owe much to his ready help. He wrote comparatively little himself, unless very strongly persuaded; but he contributed several papers to the *Proceedings of the Bristol Naturalists' Society* and to the *Quarterly Journal of the Geological Society*. For many years he worked with the late S. S. Buckman, and his name appears on the title-pages of the seven volumes of "Yorkshire Type Ammonites" and "Type Ammonites", for which he provided most of the photographs. But his contribution, as Buckman always freely admitted, was not confined to the preparation of plates; his great knowledge of the detailed stratigraphy of the Lias in particular was of great service to his collaborator.

Mr. Tutcher was probably the first person in Britain to build a piece of equipment for the lighting and photography of fossils, a work in which he acquired such skill that, twenty years ago, it was nearly always possible, on skimming a volume of geological papers, to pick out by their high quality the illustrations prepared by Tutcher; for in this field he was always ready to help others, and it has been estimated that he provided for reproduction photographs of several thousand fossils.

Mr. Tutcher was awarded the Lyell Fund by the Geological Society in 1924, and received the honorary degree of master of science from the University of Bristol in 1927. He was for many years a prominent member of the Bristol Naturalists' Society, of which he became president. He was also president of the South-Western Naturalists' Union. His modesty and kindness will long be remembered by those who were privileged to work with him. A. E. TRUEMAN

Prof. F. K. Kleine

PROF. FRIEDRICH KARL KLEINE, a distinguished pioneer and leader in the field of research into tropical diseases of man and animals in Africa, died in Johannesburg on March 22 at the age of eighty-one.

Kleine was born on May 14, 1869, at Stralsund, a Baltic port of Germany. He was the son of a medical practitioner, and early decided to follow his father's profession, entering the University of Halle as a medical student. After qualifying, he worked at the Pharmacological Institute in Halle, and at the University Clinic in Kiel, and served also for a time in the Army Sanitary Service. In 1900 he was appointed to the staff of the Institute for Infectious Diseases in Berlin, and there became personal assistant to Prof. Robert Koch, the discoverer of the tubercle bacillus and of the cholera vibrio. In 1903 Kleine went with Koch to Southern Rhodesia to investigate a disease, thought to be redwater, in cattle, which was causing great economic losses. Their investigations showed the disease to be tick-borne and distinct from redwater, and they named it 'African coast fever'. This finding led Kleine to become one of the first to work on the developmental stages of the parasite of tick fever in dogs—a story which is still not properly elucidated. During 1906–7

Kleine was seconded for service with the German Sleeping Sickness Expedition in East Africa under Koch's leadership. His particular researches related to preventive measures against the disease. Later he returned to East Africa as leader of a campaign against sleeping sickness. On this visit he made the important discovery that the trypanosome causing the disease is not carried from the sick to the healthy by the tsetse fly in a direct mechanical way, as had been believed, but undergoes a fairly prolonged cycle of development in the fly after the fly has fed on infected blood. This discovery by Kleine opened a new road to investigators, and led to many advances in knowledge of the epidemiology of trypanosome diseases.

After an interruption to research caused by the First World War, Kleine was granted permission in 1921 to visit Northern Rhodesia and the Belgian Congo to test a new drug, 'Bayer 205' ('germanin'), in human and animal trypanosomiasis. In 1926 he was nominated as the German delegate on the League of Nations International Commission on Human Trypanosomiasis, and, working in Uganda, Kenya and Tanganyika, he investigated problems of immunity against trypanosomes in natives living in chronic foci of sleeping sickness.

In 1933 Kleine was elected president of the Robert Koch Institute in Berlin, where he continued his researches on relapsing fever, foot-and-mouth disease, rinderpest, trypanosomiasis and other tropical and veterinary diseases, revisiting Southern Rhodesia and East Africa during 1934-35, and South Africa during 1936-37. In 1947 he retired to South Africa, where he spent the last days of his life.

Kleine's patent honesty, his conscientiousness in research, his sense of humour, and unvarying courtesy won for him many friends among his colleagues and British co-workers in Africa. He married Hanna Oeckelmann, who accompanied him on his many journeys and assisted him in his scientific work during the last thirty years of his life, and who survives him. They had one son, who was killed in Bucharest in the Second World War.

R. L. SHEPPARD

Mr. A. S. E. Ackermann

MR. A. S. E. ACKERMANN died at the age of eighty-three on April 7. He practised as a consulting engineer in Westminster and his work covered a wide range.

Though born in London, Ackermann received his first training at the South African College, now the University of Cape Town. Later, in London, he was one of the early students at the City and Guilds College, where, after gaining his associateship in civil and mechanical engineering, he was employed by Prof. W. C. Unwin as his assistant, and many years later was elected a Fellow of the College.

Ackermann made good use of his scientific training and was always an ardent advocate of adequate qualification for all practising in any branch of science. He took the degree of B.Sc.(Eng.) and later served as deputy chairman of Convocation of the University of London, after having been for eleven years honorary general secretary of the London Graduates Association. He was secretary of the Society of Engineers for more than thirty years, and for several years was the honorary general secretary of the British Section of the International Association of Journalists.

In the many branches of engineering in which he worked and gave advice, Ackermann's approach was always scientific and logical, and for that reason he was an extremely good expert witness and was successful in cases relating to noise and smoke nuisance and in 'ancient lights' disputes. He believed that it was possible to do effective practical research without the use of complex apparatus, and gave proof of this in 1919 when he did pioneer work investigating the physical properties of clay, using only household appliances. The results were given in three papers published by the Society of Engineers, in which he established a critical point which he called 'the pressure of fluidity'.

In about 1907 Ackermann became interested in the development of power from solar energy, and as engineer to a syndicate he was responsible for the designs and experiments made with several plants. The first of these was tested in America, and the final plant, which was tested in Egypt, was more elaborate; by using focusing mirrors, it produced steam at a low pressure, which was supplied to a specially designed engine. A full description of this test, together with particulars of all earlier attempts to develop solar energy, was given in a paper by Ackermann published by the Society of Engineers in 1914.

The examination of commonly accepted statements which could be checked and refuted on a scientific basis attracted Ackermann, and the collection of such cases became an absorbing interest to him. In 1907 he published a collection of these cases under the title "Popular Fallacies", which proved very successful. He continued to collect fallacies in ever widening fields, and in the fourth edition of this work, published in 1950, no less than two thousand are treated and classified under twenty-seven headings.

Ackermann was a familiar figure at the meetings of numerous engineering and scientific societies and will be missed by many. He married in 1901, and his widow and two daughters survive him.

J. S. WILSON

Dr. H. J. Finlay

MICROPALAEONTOLOGY in New Zealand has suffered a serious loss in the sudden death of Dr. Harold John Finlay at his home in Karori, Wellington, on April 7. Born at Cronilla, India, in 1901, Finlay went with his parents to Dunedin, New Zealand, within a few years. He received his primary and secondary education at the Normal School there, and, after a brilliant career at the University of Otago, graduated M.Sc. in 1921 with first-class honours in chemistry. For two years, as John Edmond Fellow, he did post-graduate work in chemistry, and for the next three years was National Research Scholar in palaeontology under Prof. W. N. Benson. For the following three years he was biologist to the Fisheries Branch of the Marine Department.

During the period 1923-31, Finlay published about thirty papers on molluscan systematics, mostly in the *Transactions of the New Zealand Institute* (later, *Trans. Roy. Soc. N.Z.*) but some in the *Proceedings of the Malacological Society of London*. In 1926 he was awarded the Hamilton Prize for his published work, and in the following year he obtained his D.Sc. with an outstanding "Further Commentary on N.Z. Molluscan Systematics" (*Trans. N.Z. Inst.*, 57, 320). Other important papers are, "New Shells from N.Z.