

McCance and his colleagues found in human feeding trials that the absorption of calcium was less efficient with wholemeal bread than with white bread as the main constituent of the diet. The addition of calcium to National flour was therefore undertaken in order to compensate for the increased amounts of phytic acid which resulted from the higher extraction-rate.

Unidentified rachitogenic agents have also been encountered in animal feeding-stuffs. Yeast is a valuable source of proteins and B-vitamins for pigs; but Dr. S. K. Kon and his colleagues have found that it causes rickets unless cod-liver oil, or some other source of vitamin D, is also given. Dr. T. K. Ewer has observed rickets in sheep reared in the southern island of New Zealand, where young green cereals are used as fodder. The condition responds to treatment with vitamin D; exposure to sunlight, however, is not effective, the tendency to rickets being greatest when good weather causes a rapid growth of the fodder.

Fatal hæmorrhages, associated with a prolonged blood-clotting time, have long been known to occur in cattle fed upon defectively cured sweet-clover, and Link and his colleagues identified the toxic agent as dicoumarin. Since full protection against the action of this substance may be secured by the administration of vitamin K, it may be regarded as a typical toxin in the sense implied by Mellanby. Dr. P. Meunier, of Lyons, has studied the quantitative balance between hæmorrhagic agents and vitamin K in the rabbit. Several synthetic analogues, including phenyl indanedione, have been found to cause increased clotting times, although they are generally less active than dicoumarin.

Imbalance of Fat-soluble Vitamins

Under this heading, Dr. T. Moore discussed the effects of toxic overdosing with one vitamin, and also the effects of deficiency or excess of various nutrients on the activity of the fat-soluble vitamins. Thus, massive overdosage with vitamin A leads in rats to skeletal fractures and hæmorrhages which are reminiscent of scurvy, while this disease has also been diagnosed in an American child given absurdly large doses of vitamin A. It has been reported that vitamin A deficiency causes a secondary deficiency of vitamin C in rats and silver foxes; but the significance of this vitamin in both deficiency and excess of vitamin A remains undecided. Hypervitaminosis A in rats, however, undoubtedly leads to a prolonged blood-clotting time which can be corrected by giving vitamin K.

The demands of the organism for carotene or vitamin A may be influenced by many factors. Extensive animal experiments have indicated that vitamin E, a powerful antioxidant, protects vitamin A from destruction in foodstuffs during storage, in the products of their partial digestion passing through the intestinal tract, and in the tissues of the consumer. In the human subject the habitual use of medicinal paraffin may seriously interfere with the absorption of carotene. Early work by Mellanby indicated that certain cereal products, and also ergot of rye, may emphasize the effect of vitamin A deficiency in causing nervous lesions, which his later work has associated with disordered growth of bone.

Massive overdosage with vitamin D causes excessive calcification, and doses approaching the toxic level have been found by Charpy and by Dowling to be valuable in the treatment of cutaneous tuberculosis.

Deficiency of vitamin E in experimental animals causes not only reproductive failure but also many other lesions including muscular dystrophy, brown pigmentation of the uterus and adipose tissues, exudative diathesis, encephalomalacia, renal abnormalities and dental depigmentation. Most of these lesions are increased in severity by an inadequate protein allowance, and by the inclusion in the diet of cod-liver oil or other highly unsaturated fats. Conversely, the lesions may be avoided or reduced in severity by removing fats from the diet, and by including adequate amounts of protein, choline, methionine and inositol. In general, therefore, liability to the effects of vitamin E deficiency is increased by the consumption of readily oxidizable fats, and decreased by adequate dietary supplies of the lipotropic factors which facilitate the mobilization and transference of fats.

Mr. A. L. Bacharach summarized the day's proceedings, and expressed his satisfaction in the success of the meeting in bringing together a mass of information on an interesting and important subject.

OBITUARY

Sir John Fryer, K.B.E., F.R.S.

AGRICULTURAL science has suffered a severe loss by the death on November 22 of Sir John Fryer, secretary of the Agricultural Research Council, at the age of sixty-two. The news came as a great shock to his many friends both in scientific and administrative circles.

John Claud Fortescue Fryer was born on August 13, 1886. His family had been farmers in Cambridgeshire and Huntingdonshire for generations, and his early years were spent at Chatteris in the fenlands; he was always happy to return to the East Anglian countryside. He was at school at Rugby and went on to Gonville and Caius College, Cambridge, where he took a first class in the Natural Sciences Tripos and a little later was elected a fellow of the College. He already had a good knowledge of British insects and, like his father and grandfather before him, was a keen collector and field naturalist. Some years abroad followed. He joined the Percy Sladen Expedition to Aldabra Island, in the Indian Ocean, and wrote a valuable account of the natural history of the island; he also spent some time in Ceylon where he worked on the genetics of the butterfly *Papilio polytes*. On returning to England, Fryer was appointed entomologist to the Ministry (then Board) of Agriculture, and devoted himself to the study of insects of economic importance in agriculture and horticulture. It was a new post and he started work in an office in Northumberland Avenue without laboratory accommodation or equipment. After a pioneering period, a small staff of entomologists and plant pathologists was recruited and the Ministry's Plant Pathology Laboratory established. Accommodation was found for a time at Kew, and in 1920 a move was made to permanent quarters at Harpenden, where Fryer made his home. As director of the Laboratory, he took a leading part in dealing with a great variety of problems and inquiries concerning insect and other pests of crops, in fostering and initiating research on control measures, and in establishing an efficient advisory service in these subjects throughout Great Britain. One of his major problems was the continually increasing threat of the

introduction into Britain of the Colorado beetle after its establishment on the Continent of Europe.

In 1941, the Ministry formed the Agricultural Improvement Council to act as a bridge between science and practice in agriculture, and Fryer became its first secretary. His work for some years had involved close contacts with the Agricultural Research Council, and in 1944, following the death of Dr. W. W. C. Topley, he accepted appointment as secretary of the Council. It was with some misgiving that he undertook this onerous task, for it meant continuous office-work in London, and he knew that there would be little or no time for his entomological interests.

In addition to his scientific attainments, Fryer possessed high administrative ability, and his appointment was quickly justified. His practical knowledge of farming, acquired in his early days, combined with a long experience of the application of scientific method in agriculture, admirably fitted him for the work. Moreover, he had, to a rare degree, the capacity to see and state clearly and succinctly the essential points of any problem, and many who sought his advice could testify to his clear-sighted,

logical and helpful discussion of their difficulties. He was especially good in committee, where his sure grasp of essentials and his tactful guidance often brought a rambling discussion to a point.

Fryer was a real countryman and naturalist and a keen fisherman. He was at his best on a collecting expedition in some remote part of the country, and the briefest holiday was spent, if possible, where he could search for specially interesting or rare insects. He had fine collections of British Lepidoptera, Coleoptera and Hemiptera-Heteroptera and was an expert on the Microlepidoptera. He took great interest in the conservation of the British fauna and flora and was an active member of the Society for the Promotion of Nature Reserves and of various committees of the National Trust. He served as president of the Association of Applied Biologists and of the Royal Entomological Society; he was elected a fellow of the Royal Society in 1948. His official services were recognized by a knighthood in 1946.

In 1919, he married Constance Joan Denny-Cooke, of Bergh Apton, near Norwich, who, with a son and daughter, survives him. He was buried at Bergh Apton.
C. T. GIMINGHAM

NEWS and VIEWS

The National Physical Laboratory, Light Division:
Mr. T. Smith, F.R.S.

ON his retirement last July, Mr. T. Smith completed a period of forty-one years service at the National Physical Laboratory, where he was in charge first of the Optics Section of the Physics Department and later of the newly created Light Division. The long series of investigations on geometrical optics which have established Mr. Smith as a leading authority in the subject were begun a few years after he entered the Laboratory with a paper to the Optical Society entitled "Practical Optical Calculations". This was the key for much of his later work. His outstanding contributions have been to the theory of algebraic, as distinct from trigonometric, methods of optical design, and in the development of methods of computation based on the use of calculating machines. A feature of many of his later papers has been the masterly application of matrix methods to optical problems. As is so often the case when alternatives to old-established procedures are offered, the adoption of Mr. Smith's design methods in the industry has been slow; but there are now signs that their value is being appreciated. Mr. Smith's work was recognized by his election to the Royal Society in 1932, and he has held the office of president both of the earlier Optical Society and the Physical Society. The younger workers in his subject recall with appreciation the care he always took that they should have the fullest opportunity to develop their views however unorthodox or immature. It is appropriate that the council of the Physical Society should have invited Mr. Smith to deliver the sixteenth Thomas Young Oration; this he has agreed to do in June 1949.

Dr. L. A. Sayce

DR. L. A. SAYCE, who has succeeded Mr. T. Smith as superintendent of the Light Division at the National Physical Laboratory, is fifty years of age.

After serving in the Honourable Artillery Company in the First World War, he went to the University of Durham to study chemistry, taking honours in 1922, when he was awarded the Saville Shaw Medal. He remained at Durham carrying out research in inorganic chemistry, was awarded his Ph.D., and in 1927 was appointed University lecturer in chemistry. He remained at Durham until 1940, carrying out during this period considerable fundamental work in inorganic chemistry, instrument design, chemical kinetics and photography.

In 1940 Dr. Sayce joined the Ministry of Home Security to initiate a research group in connexion with camouflage, where he did excellent work until 1943. He was then transferred to the Ministry of Supply to take charge of alginate research. Unfortunately, he fell seriously ill soon after receiving this appointment and was away from active work for a year. On recovery he was appointed to the Scientific Research Department of the Admiralty as a principal experimental officer, and in this capacity he was responsible for considerable advances in the development of all kinds of instruments for laboratory use in the Admiralty experimental establishments. In particular he did excellent work in the applications of high-speed photography for laboratory purposes. On the re-organisation of the Admiralty Scientific Service in 1946, he was appointed assistant director of physical research. Dr. Sayce has earned a very high reputation in a wide field of science, and he brings to his new appointment a keen appreciation of the value of fundamental research and an exceptional ability to plan and supervise it.

Zoological Society of London:

Mr. G. S. Cansdale

MR. G. S. CANSDALE has been appointed superintendent of the Zoological Society's Gardens in Regent's Park, London, in succession to Dr. G. M. Vewers, who retired on December 15 (see *Nature*, November 6, p. 727). Mr. Cansdale was educated at