

possibly other considerations, the final order of priority was: (1) dairy cows (as milk); (2) sheep and feeding cattle; (3) pigs for meat production and poultry for egg production.

It may be as well to point out that the Government of 1918⁴, faced with a similar situation, placed the order of priority as follows: (1) working horses; (2) dairy cows; (3) breeding stock. Some allowances were to be made to pigs and poultry and breeding ewes, but none to fattening sheep or fattening cattle. The present order of priority for feeding-stuffs has caused the false impression to arise that both pigs and poultry are wasteful converters of feeding-stuffs; moreover, statements have appeared in the Press to the effect that this is the considered opinion of men of science. It may, therefore, be as well to consider the available evidence on this point.

At the present time the main problem that appears to be facing Great Britain so far as food supply is concerned is a prospective shortage of food proteins, particularly those of high biological value. The most efficient use of animal feeding-stuff protein for the production of human food protein consequently appears to be called for, and our considerations may therefore be conveniently directed to this issue.

In 1939 I made a careful estimate of the relative efficiencies of the various classes of farm animals as converters of feeding-stuff protein to human food protein. In this estimate, 100 lb. of digestible feeding-stuff protein yielded the following amounts of food protein available for use by humans: (1) dairy cow (as milk, yield 600 gallons a year), 35.8 lb.; (2) hen (as eggs, yield 140 eggs a year), 31.6 lb.; (3) pig (as pork), 21.2 lb.; (4) hen (as meat), 18.0 lb.; (5) bullock (as baby beef), 7.8 lb.; (as Norfolk beef), 5.9 lb.; (as grass beef), 5.4 lb. Owing to the absence of adequate data no estimate of the value of the sheep as a converter of feeding-stuff protein was made; but the opinion was given that, whereas grassland sheep production should be encouraged, arable land sheep should be dis-

couraged, since in the latter case the land required for sheep keep could be better utilized for the production of grain and vegetables for direct human consumption. This memorandum was submitted to the appropriate Government departments and doubtless received due consideration. More recently, Leitch and Godden⁵ have presented a report on the point at issue, after consideration of all the available scientific data. Placing their results in order of priority so far as efficiency of conversion of feeding-stuff protein to human food protein is concerned, we get the following results: 100 lb. of protein equivalent yield (1) dairy cow (as milk, yield 2 gallons a day), 35.1 lb.; (2) hen (as eggs, yield 200 eggs a year), 26.4–29.8 lb.; (3) hen (as meat), 21.8–26.3 lb.; (4) pig (as pork), 19.0 lb.; (5) baby beef, 15.5 lb.; (6) sheep (as lamb), 13.2 lb.; (7) fat bullock, 8.7–8.9 lb.

Although arrived at by different methods of computation and from different sources, it is of interest to note that roughly the same order of priority is reached by these authors as by my earlier estimate, and gives confidence in the view that the order of priority so established is in accordance with actual fact.

Regarded strictly, therefore, from the point of view of efficiency of conversion of feeding-stuff protein to human food protein, the hen as an egg producer would appear to rank in order of priority next to the dairy cow, and judged on this ground alone the hen has a better claim to available food supplies than any class of farm animal other than the dairy cow. Moreover, the results obtained indicate that the decision of the Government in 1918 not to allot supplies of feeding-stuffs to fattening sheep or fattening cattle was justified.

¹ De Sanctis, A. G., *Arch. Pediat.*, **39**, 104 (1922).

² Tweddell, F., *Med. Record*, N.Y., **100**, 935 (1921).

³ Hess, A. F., *J. Amer. Med. Assoc.*, **81**, 15 (1923).

⁴ "Live Stock Policy of Board of Agriculture and Ministry of Food", *J. Bd. Agric.*, **24**, 1177–1180 (1918).

⁵ Leitch, I., and Godden, W., Technical Communication No. 14, p. 46, *Imp. Bur. Anim. Nut.* (1941).

OBITUARIES

Sir Shah Mohammad Sulaiman

AS chief justice of the High Court at Allahabad for several years and as vice-chancellor of the Aligarh Muslim University over a considerable period, Sir Shah Sulaiman was a well-known public figure in India. During the last few years of his life he held the distinguished position of one of the three judges of the newly established Federal Court at Delhi. The news of his death early this year at the age of fifty-five came as an unpleasant surprise to his many friends and admirers, and elicited

numerous well-merited tributes to his personality and career.

Sulaiman studied mathematics and physics at Cambridge, taking Part II of the Mathematics Tripos in 1909. During his subsequent career as a practising barrister and as a judge at Allahabad, he continued to retain a general interest in the progress of physical science. Later in life, the stimulus of contact with the University staffs at Allahabad and Aligarh led him actively to undertake the study of theoretical physics as a subsidiary pursuit.

Sir Shah's high position in public life secured for his writings and lectures on scientific topics the widest publicity in India, as also a sympathetic, though critical, reception from his academic friends and colleagues. His published papers indicate a marked reluctance to accept the ideas of the newer physics as expounded by the leading authorities on the subject. They largely consist of attempts to explain the facts of the newer physics on the basis of classical or semi-classical ideas aided by special hypotheses. It could scarcely be hoped that work on such lines would find general acceptance.

Sir Shah Sulaiman was the recipient of honorary doctorates from the Universities of Allahabad and Aligarh in recognition of his eminent public services and his deep interest in the cause of education and science.

C. V. RAMAN.

Mr. W. A. Taylor, O.B.E.

THE death occurred on August 18 at St. Albans at the age of sixty-eight of Mr. W. A. Taylor, a former superintending examiner at the Patent Office.

After spending eight years at the railway works at Crewe, Taylor obtained a Whitworth scholarship and proceeded to the Royal College of Science, from which he entered the Patent Office as an assistant examiner in 1897, at the age of twenty-five. During the earlier part of his career, he dealt with inventions relating to gearing and clutches. In 1915 he was loaned to the Munitions Inventions Department where he was particularly associated with the early development of the tank and with experiments on body armour, including head protection by steel helmets.

Returning to the Patent Office at the end of the War, he was placed in charge of one of the examining divisions in 1925, and from 1927 until his retirement in 1936 was superintending examiner in charge of classification, during which time he made his main contributions to the work of the Office. Under his direction a separate classification division, akin to that existing in the United States Patent Office, was set up, and he was responsible for the amalgamation of the unclassified series of illustrated abridgments, which had appeared weekly in the *Illustrated Official Journal of Patents* from the time of Mr. Chamberlain's Patents Act of 1883, with the classified series which had been published at intervals from 1894 onwards. By this reform, the classified abridgments were issued sheet by sheet in forty group-volumes within a few weeks of acceptance of the specifications instead of after a period of many months. Another important duty undertaken by Taylor was the setting up of machinery for carrying out the extended search for novelty instituted by the Patents Act of 1932 by which United States specifications and other publications were brought into the field of search.

In the difficult and controversial subject of the classification and indexing of the subject-matter of inventions, Taylor was an advocate of the analytical method and favoured the collection of data relating to materials and machine elements of general application.

He took an active interest in the welfare of the

staff and was for some years chairman of the Examining Staff Association. Apart from his activities in the Office, he had many interests in the realms of music, education, sport and travel, and his generous nature and human attitude to affairs gave him a wide circle of friends.

Mr. J. Duncan

THE death of John Duncan on July 28 will be regretted by the many engineers, all over the world, who have at some time been his students. He was seventy-two years of age and had for several years suffered severely, although in the end, the acute stage of his illness lasted only a few days.

Duncan went to Hutchinson's Grammar School in Glasgow, his birth-place, and his early training in engineering was received at the works of Messrs. Duncan Stewart & Co., Ltd. He studied at the Royal Technical College, Glasgow, and then in the University of Glasgow. From there he was appointed, in 1896, as lecturer in engineering at University College, Nottingham. In 1898, at the opening of the Municipal Technical Institute at West Ham, now the West Ham Municipal College, he was appointed lecturer in mechanical and civil engineering, and after a short time became head of the Department of Engineering. His organizing ability soon showed itself, for a set of empty rooms quickly became a department excellently equipped both in staff and machinery.

On the reconstitution of the University of London in the early years of the century, Duncan was made a 'recognized teacher' in the University in engineering, being one of the first so appointed. He served on the Board of Studies in Engineering in the University until his retirement from teaching in 1929, and on many occasions was examiner in the subjects of engineering.

Duncan's lectures and practical courses at West Ham were always the admiration of his colleagues, for as well as being thoroughly skilled in practice and draughtsmanship, he had a wide knowledge of theory and always spurred on his students in the mathematical side of their work. His clearness of exposition will always be appreciated where the many text-books that he contrived to write during his busy career are used.

WE regret to announce the following deaths :

Prof. A. G. Green, F.R.S., formerly professor of tinctorial chemistry in the University of Leeds, and director of research to the British Dyestuffs Corporation, on September 12, aged seventy-seven.

Mr. John Still, formerly secretary of the Ceylon Association in London and an authority on the antiquities and natives of Ceylon, on September 9, aged sixty-one.

Dr. Guy Wood, who had been honorary treasurer of the Marine Biological Association of the United Kingdom since 1934, on September 4.