

In this way the range of genetic variation has been greatly increased.

The nature of yield in some species is being investigated genetically and physiologically with the aid of special growth chambers.

Biochemical Investigations

Great importance is attached to the breeding of new varieties of improved quality and in this the chemical laboratory is closely concerned.

More fundamental studies are concerned with the enzyme changes associated with the ripening of seeds. In a country extending as far north as northern Iceland, and as far south as Northumberland, the ripening of grain and other seed crops is of special importance.

Cereal Breeding

The breeding of spring oats at Svalöf has been of inestimable value to Britain.

Victory, Eagle, Star, Sun II and Blenda all came from Svalöf, and these represent some of the best-known varieties grown in Britain during the past fifty years. (A peculiar rhythm of growth is needed in oat varieties grown around Lake Mälaren, where severe drought conditions are likely to occur in spring, and the most successful varieties are those in which the shooting of the tillers is delayed for a period.)

Barley varieties in Sweden cover a wide range of climatic conditions, and Svalöf has been successful in breeding early six-row barleys for middle and northern regions as well as the varieties for southern Sweden, of which Ymer and Freja have been successful in Scotland and England.

Barley has been used as a convenient subject for experiment at Svalöf to find how the mutation process may be directed towards the production of desirable mutants. Much is being learnt by the association of cytogenetical analysis of the mutations with a close observation of field characters in barley.

Herbage Crops

The ecotype concept was largely developed in Sweden, and it is not surprising that special attention has been given to the interesting range of regional types of red clover growing between southern Sweden and the northern limits of the crop. Day-length reactions are being studied in relation to growth rhythm, time of flowering and to the stage at which reserve nutrients are stored. Of notable success is the work on resistance to stem nematodes in red clover.

The Filial or Branch Stations

Most of the new varieties introduced in recent years have been the result of collaboration between

the main station at Svalöf and one or more of the eight 'filials' or branch stations. At Ultuna (Uppsala), for example, some of the main work on red clover, lucerne and peas has been undertaken. Vegetable crops, if one excepts the important pulse crop of dried cooking peas, are not at present included in the programme of work of the Association.

Seed Certification and Distribution

To relieve the Swedish Seed Association of the task of multiplying and distributing seed of the Svalöf varieties, the General Swedish Seed Co. was established in 1891. In Sweden, the seed trade is organized differently from Britain, and the Seed Co. at Svalöf finds it necessary to produce large tonnages of seed. This is done partly on the farms owned by the Company.

The Swedish Seed Association co-operates closely with the Central Government Seed Testing Station in the production of State certified seed, and all the seed which leaves Svalöf is of certified grade.

From the beginning the Swedish Government has given monetary support to the plant-breeding work, and this at present amounts to about £135,000 a year. Other sources of income are the profits from the General Swedish Seed Co. at Svalöf, research grants and donations from foundations and private organizations, and fees for analyses made in the laboratories.

Links with Britain

By the year 1919 Svalöf was already well established, and it was natural that representatives of the National Institute of Agricultural Botany, founded in January 1919, should visit Svalöf to take advantage of the unique experiences gained there in crop improvement work. In the party representing the Council of the National Institute of Agricultural Botany was Prof. R. G. Stapledon, then newly appointed to Aberystwyth. The value of the ecological approach to variety testing, and to the collection and use of local varieties and ecotypes developed in Sweden was particularly appreciated by the visitors from Britain. The ecotype concept was to be further developed by Stapledon at the Welsh Plant Breeding Station, and by J. W. Gregor in Scotland.

Exchange visits between Svalöf and the crop improvement stations in Britain have been numerous in recent years during the directorship of Prof. E. Åkerberg, and they have undoubtedly been of great benefit to both countries.

All workers in crop improvement, whether agricultural botanists, plant breeders, farmers or seedsmen, will join in congratulating the Swedish Seed Association on the remarkable achievements of the past seventy-five years and in sending good wishes for the future.

F. R. HORNE

OBITUARY

Prof. Eric Bradshaw, M.B.E.

PROF. ERIC BRADSHAW died suddenly at his home in Marple, Cheshire, on August 15. He was aged fifty-two and was professor of electrical engineering and director of the Electrical Engineering Laboratories in the Faculty of Technology of the University of Manchester at the Manchester College of Science and Technology.

Eric Bradshaw was the son of Lady Bradshaw and the late Sir William Bradshaw, and was educated at

King's School, Grantham, and in the Department in which he later became professor. He was a student under Prof. Miles Walker and graduated in the University of Manchester with a degree of B.Sc.(Tech.) with honours in 1930, and with the degree of M.Sc.(Tech.) in the subsequent year. Following his graduation he spent some time with the British Thomson-Houston Company at Rugby.

He became a lecturer and afterwards special lecturer in high-voltage engineering at the Royal Tech-

nical College, Glasgow, during 1933-44. While in Glasgow he was responsible for the inception there of the high-voltage laboratory and gained his Ph.D. at the University of Glasgow. In 1944 Eric Bradshaw moved to his old Department in the College of Technology, Manchester, as senior lecturer in high-voltage engineering; he was appointed professor of electrical engineering in October 1952.

After the War he was a pioneer in the organization of courses at a very high level for the senior engineering staff of the newly nationalized electricity supply industry and was responsible for many such courses at Electricity Hall, Buxton, during the years 1947-52. Most of these courses, changing their content from time to time but retaining Bradshaw's form of organization, eventually became a standard part of the educational activities of the Central Electricity Authority (later the Central Electricity Generating Board) and the Area Boards. During the same period he founded, in 1948, the *Bulletin of Electrical Engineering Education*, and continued thereafter as organizer and editor until his untimely death. This journal to-day circulates to between four and five hundred universities, colleges and other subscribers throughout the world.

Bradshaw's published work and interests lay in four categories. In the field of units, symbols and nomenclature, he was one of the authors of a well-known symposium of papers to the Institution of Electrical Engineers on the m.k.s. system of units, was the author of a book on the same subject, and served on British standards and international electro-technical committees. During his career at Glasgow and his early years at Manchester he published work on high-voltage measurements using oscillating electrode systems. Immediately afterwards his attention

turned to problems of the power supply industry, and he was responsible for several devices for the direct measurement of rate of change of frequency, one of which was published by the Institution of Electrical Engineers. His latest interests lay in the field of electric railway traction. He was responsible for the design and building at Manchester of a track performance calculator for British Railways, the details of which were published in a paper for the Institution of Electrical Engineers; latterly this work had extended to analogue devices for determining short-time thermal ratings of traction equipment.

He was known throughout the length and breadth of Britain for his work in furtherance of higher education; many were the advisory committees, colleges and universities to which he gave his time. Many indeed, furthermore, are the individuals, both within and without his profession, who have reason to be grateful for his kindness of heart. Eric Bradshaw was incessant in his activity on behalf of cases of adversity and hardship which came his way; this particularly, but in no way exclusively, applied to any student who through no fault of his own was likely to be incapable of pursuing his studies.

Eric Bradshaw was a keen amateur musician, played with the orchestra organized from time to time in the College of Science and Technology, and generously gave his time and support to musical events in the College, particularly those centred around the organ. Perhaps his greatest lay interest was in the history of the Industrial Revolution. He was intensely interested in the development of railways and canals, and frequently lectured to societies and schools on these subjects. He married Joyce Ena Smith in 1935, by whom he is survived.

C. ADAMSON

NEWS and VIEWS

The Norman Lockyer Observatory :

Mr. D. R. Barber

MR. D. R. BARBER retired on September 30 from his post as superintendent of the Norman Lockyer Observatory at Sidmouth, after twenty-five years service (see also p. 108 of this issue). He was appointed as assistant to the late W. J. S. Lockyer in September 1936 and on Lockyer's death in December continued with the new director, D. L. Edwards, until 1956, when Edwards died; Barber then became superintendent. Edwards and Barber introduced precise methods of photographic photometry into the evaluation of stellar spectra. From 1938 they applied the Greenwich colour temperature technique in a modified form to the measurement of spectrophotometric gradients and their work on the changes in the continuous spectrum of γ -Cassiopeia (*N.L.O. Comm.*, 58, 62, 64) is well known. About this time Barber built the first of a series of night-sky photometers, designed to measure the green, OI, line of the air-glow. This instrument was taken to the Lick Observatory, Mount Hamilton, on Barber's appointment to a Martin-Kellogg fellowship in the University of California (1940-41). With this he demonstrated for the first time a definite correlation between the intensity of the green line and geomagnetic activity (*Nature*, 148, 88 (1941)).

During 1941-45, Barber worked at the Kodak Research Laboratories in England, and on his return

to the Observatory he became interested in the sodium *D*-line emission in the twilight and night skies, which he studied by photographic and photoelectric methods. He established the presence of highly polarized twilight emission following solar flare and geomagnetic activity (*J. Atmo. Terrest. Phys.*, 10, 172; 1957), and a dependence of the intensity of emission on lunar phase, presumably because of tidal movement of the upper atmosphere at the level of sodium emission, 70-110 km. (*Intern. Astro. Union Draft. Rep.*, Berkeley Meeting, August 1961; *Rep. Comm.*, 21, *Luminescence du Ciel*). Lately Barber's interests have broadened to include solar-terrestrial relationships; certainly he has already obtained fascinating and remarkable results. Those on the effects of living organisms will certainly keep him occupied in his retirement.

John T. Tate Medal of the American Institute of Physics :

Dr. P. Rosbaud

DR. PAUL ROSBAUD has been awarded the first John T. Tate International Medal for distinguished service to physics. The Medal is of gold and has been established in order to recognize distinguished service to physics by individuals who are neither residents nor citizens of the United States. 1,000 dollars accompany the award. The late Prof. J. T. Tate, who died on May 27, 1950, was dean of the College of Science, Literature and Arts at the University of Minnesota, and served as research professor of physics,