

development of the community, or their purchase from outside in exchange for commodities produced at home, by the minimum expenditure of effort. In place of the existing credit system, the creation by the Treasury of notes to the value of goods and services available is suggested. These notes would be issued to individuals as wages or endowment, according to age, grade, or services rendered. No one would receive notes which are insufficient in value for the maintenance of a normal, ample life, and while suitable compulsion would be provided regarding a necessary two months' maintenance work, it would be unnecessary to fix an upper limit of remuneration since additional notes would be issued only for actual services and could not be loaned at interest. Under this system no taxation would be required, as the notes necessary to cover all national services would be withheld from distribution. Endowed leisure would be a prominent feature, and the system would definitely lead towards regional specialisation, the exchange between which would be by means of goods.

Chromosome Studies and Plant Breeding

THE breeding of plants with the object of obtaining new and improved varieties is at best a slow and laborious process, with chances of success by no means assured. Any means of prediction of the probable results of a cross would be of immense value, and Dr. Darlington shows in a series of eight papers¹ how far this object may be attained by a previous knowledge of the cytology of the forms to be crossed.

The author passes to the practical view of the question with the minimum of technical detail, and shows how very closely the behaviour of plants in breeding can be correlated with their visible chromosome behaviour. He gives us the picture of a fertile germ cell as carrying a set of chromosomes, which must represent a complete and balanced set of characters, for in exceptional cases such germ cells are able to develop into a new plant without fertilisation. Normally two sets of chromosomes come together at fertilisation and remain associated throughout vegetative growth until germ cells are formed again. In this latter process, an exact pairing of like chromosomes, which afterwards separate, one of each pair passing to each daughter nucleus, is usually associated with the production of fertile germ cells. Irregularity in this pairing frequently results in the production of unbalanced sets of characters in the germ cells, with loss or great reduction in fertility. This is a fundamental point in cross breeding, where the value of the hybrid depends on seed fertility, as in the case of cereals, cherries, and plums.

On the other hand, crosses between plants with different chromosome numbers, which result in sterile hybrids, may have advantages when the plant is required for ornamental purposes and can be propagated vegetatively.

Another interesting fact which has emerged from comparatively recent cytological work is that related species of plants often have either the same chromosome number or some multiple of a basic number; that is, they are naturally occurring 'polyploids'. Work on plants in cultivation and under cytological observation has brought forward facts which are most suggestive as to a possible way in which species may have been derived from one another. This is illustrated by the cross between *Primula floribunda* and *P. verticillata*, which results in a sterile hybrid. Occasional fertile seeds are, however, produced, and they give rise to plants with hybrid

characters, but differing in being fertile and breeding true. Such seedlings—known as *P. Kewensis*—are found to contain twice the anticipated number of chromosomes, and as each parental set has been doubled in such plants, exact pairing is again possible with the passage of two complete balanced sets to each daughter nucleus. The relative numbers of chromosomes in naturally occurring species suggests that hybridisation followed by restoration of fertility by polyploidy is one possible method of their origin.

These and many other problems are dealt with fully in these papers. Although, as Dr. Darlington points out, the knowledge gained by a preliminary chromosome investigation cannot control the results obtained by a cross, it may be of great value in directing the activities of the plant breeder into lines which have some hope of success.

¹ *Gard. Chron.*, vol. 90, Nos. 2332-2347; 1931.

University and Educational Intelligence

CAMBRIDGE.—An appointment to a University lectureship in mathematics will be made in the Easter term, to take effect from Oct. 1. The initial basic stipend is £200 a year; but an additional allowance of £150 a year may be granted to a lecturer who is not a fellow of a College, and also a number of years' seniority carrying with it an increased basic stipend. Candidates are requested to send their names, with any evidence of qualifications which they may desire to submit, to Mr. W. J. Harrison, Secretary of the Faculty Board of Mathematics, Clare College, Cambridge, on or before April 30.

The examiners consider that the following submitted essays of distinction for the Smith's prizes and Rayleigh prizes: D. W. Babbage (Magdalene College), "Cremona Transformations"; J. Bronowski (Jesus College), "On a Representation of Primals"; J. Cossar (Magdalene College), "On Fourier Integrals"; V. V. Narliker (Non-Collegiate), "Cosmogony and Astronomical Dynamics"; H. M. Taylor (Clare College), "The Anomalous Scattering of X-Rays". The Smith's prizes are awarded to D. W. Babbage and H. M. Taylor, and Rayleigh prizes to J. Cossar and V. V. Narliker.

Dr. J. A. Venn, Gilbey lecturer in agriculture in the University, has been elected president of Queens' College.

LONDON.—The degree of D.Sc. in chemistry has been conferred on Frank Bell (Battersea Polytechnic) for a thesis entitled "Polarisation and Chemical Reactivity in Aromatic Substances" (*J. Chem. Soc.*, 1928-30).

APPLICATIONS are invited for the Henry George Plimmer fellowship in pathology of the Imperial College of Science and Technology, for research in morbid anatomy, histological anatomy, chemical pathology, protozoology, bacteriology, or allied subjects in either zoology, medicine, or botany. Applications must be made by letter to the Rector, Imperial College of Science and Technology, Prince Consort Road, S.W.7, by at latest June 11.

AN election of Beit junior memorial fellows for medical research will take place in July next and applications for them are invited. The annual value of each fellowship is £400 and the tenure usually three years. Forms of application and full information may be obtained by letter addressed to Prof. T. R. Elliott, Honorary Secretary, Beit Memorial Fellowships for Medical Research, University College Hospital Medical School, University Street, W.C.1. Completed forms of application should be returned by May 18.