## THE PASSING AWAY OF KING GEORGE

In order to express deep regret at the passing away of His Majesty King George V, a meeting of all the residents of the estate was held at the Freeman Hall at 4-15 P. M. on Friday 24th January 1936 under the joint auspices of the Madras Agricultural Students' Union, the Indian Officers' Association, the Association of Economic Biologists, the Officers' Club, the Ladies' Club, the Students' Club, the Fieldman's Association and the Association of Upper Subordinates.

Mr. R. C. Broadfoot who presided over the joint meeting spoke as follows :—

Mrs. Munro, Gentlemen,

This meeting has been called under the auspices of the various clubs and organisations at the Agricultural College to publicly express our sorrow at the death of His Majesty King George V. Similar meetings have been held all over the world and all have proclaimed the love and high regard in which His Majesty was held by every one. As a King by precept and example he was kingly, sympathetic to all his subjects and a shining example of what the head of the Empire should be. His Silver Jubilee celebration held last year must have been to him a very great joy and his speech on that occasion when he dedicated the remaining years of his life to the service and welfare of his subjects was an expression of sincerity which will not be forgotten. None realised at that time that his death was so near but we have the satisfaction of knowing that his work up till the time of his death was for the peace and welfare of all Nations. His death was peaceful as befitted a gentleman who had lived a full good life, and today we mourn his passing with very sincere regret. The British Empire has been blessed with many wise and good rulers but King George V, will live in history because of his broad sympathetic outlook and good works. With these words I now move the following motion of condolence and request that those present will stand and receive.

This meeting places on record its sense of deep sorrow at the demise of His Majesty King George V and respectfully offers its heartfelt sympathy and condolence to the members of the Royal family.

The following resolution was also then moved from the chair and passed.

This meeting begs to record its sense of loyalty and devotion to the new King Emperor, His Majesty King Edward VIII.

## THE SIXTH INTERNATIONAL BOTANICAL CONGRESS.

Sir E. John Russell, Director of the Rothamsted Experimental Station at Harpenden, England, speaking before the Sixth International Botanical Congress, called attention to the fact that plants, constantly sucking upward the water that trickles and oozes downward through the ground, profoundly affect the character of the soil in which they grow. In the eastern part of England the water drainage through cultivated soils is only about half that through uncultivated soils. The whole nature of the soil is affected, and the marked differences between feebly and strongly leached-out soils turn very largely on the intensity of action of plant roots in removing the soil water. Associated with this removal of water is also a transfer of mineral substances and nitrates from the subsoil to the aerial parts of the plant. Calcium, potassium and silica in particular are lifted in quantity to the leaves and stems; when the plants die they fall back on the surface of the soil. The details vary with individual plants, and in the end striking differences may result. The general result is, however, that this process counteracts the washing down by the rainfall, and it confers upon the soils of mild humid countries one of their characteristic properties that the upper layer tends to be richer in calcium and potassium and to be more nearly neutral than the lower layers. These characters are of profound ecological significance and react greatly upon the vegetation. The plant roots evolve considerable amounts of carbonic acid. This evolution of carbon dioxide is of special importance in dry regions where soils tend to bealkaline, for it offers the possibilityof reducing the alkalinity and so profoundly changing the vegetation. Experiments are being tried in various regions to find crops which by evolving large amounts of carbon dioxide from their roots, can be used for the reclamation of alkali soils. Plants also exercise marked influence on each other through their roots. The legumes or plants of the pea-bean-clover family, not only obtain nitrogen for their own needs through the activities of the bacteria that live in their root nodules, but also excrete it and make it available for other plants. On the other hand, several British investigators have conducted experiments, in which drainage through the perforated bottoms of trays in which plants were growing was permitted to flow over the roots of other plants. The latter were unfavourably affected, either through poisons formed by the roots in the trays, or through their absorption of all available nitrates, or through some combination action resulting finally in a nitrogen poverty. The imporance of roots in other connections was also pointed out: weed competition, crop rotations, and the final conversion of dead roots into soil humus.

The possibility was suggested of fighting the fungus diseases that now devastate crops by sowing or spraying the germs of counter-diseases. The suggestions came from research laboratories in widely separated parts of the world. Dr. S.D. Garrett. of the University of London, who carried on his studies in Australia on a destructive wheat disease called "take-all," found in certain types of soils a complex of fungi and other obscure organisms useful in combating the disease. From the University Farm, St.Paul Minn., Miss Delia E. Johnson reported the antagonism of a newly discovered species of bacterium against the smut diseases of corn and various small grains. A most comprehensive study in the field of microbiological antagonisms was presented by Professor S.Endo, of the University of Tokyo. He has examined dozens of kinds of bacteria and moulds for their effects on several different disease-causing micro-organisms. Some he has found to be decidedly depressing, others lesss so; a fair number completely lethal. It may be that bacteriologists and plant pathologists are ready to take a leaf out of the book of the entomologists, who long ago learned to fight enemy insects by turning their own insect enemies loose upon them.

Evolution appears to be at its most active state in producing new varieties of plant diseases affecting grain crops. What one species of smut fungus can do in the way of producing new strains was outlined by Professor E. C. Stakman, of the University of Minnesota. He described a research project in which a single reproductive cell of this smut fungus was isolated and its offspring propagated in the laboratory. Within a few months there were 162 distinct physiological strains of this one fungus from the single-celled start. These physiological strains of plant disease fungi are the more difficult to deal with because within a given species they all look alike, They are different only in their behaviour. Thus there is one well-known variety of stem-rust of grain that attacks wheat and barley but not rye and oats, another that attacks rye and barley but not wheat and oats, and still another that attacks oats but none of the other small grains. Under the microscope they all look exactly the same. The multiplication of fungus varieties that occurred with the smut specimen in the laboratory is duplicated thousands of times over in the field. Many new varieties rise by hybridization through sexual crossing of existing varieties, but others occur without inter-breeding, through the "straight evolution" process of mutation or "sporting". There is an endless race between the plant breeder and the natural new origin of these plant diseases. The breeder will carefully produce a new crop variety that is resistant to all known diseases—only to have a newly-originated disease attack it.

Young plants, cut down and buried in the soil as fertilizer, decay much more quickly than older plants of the same kinds do. This was one of the points discussed by Dr. Selman, A. Waksman of the New Jersey Agricultural Experiment Station. In these experiments a number of plants were cut at different stages of growth and definite amounts allowed to undergo decomposition by micro-organisms, under identical conditions. Of the young plants, 73 per cent. of their material was decomposed in thirty days, while it took sixty days to decompose only 42 per cent. of the material of older plants. One of the reasons for the difference in decomposition rate is the marked difference in the chemical make-up of older and younger plants. The older plants contain higher proportions of more resistant materials, especially the celluloses and lignins. The latter substances, which are the basis of the "woodiness" of wood, are exceedingly difficult for bacteria, fungi and other micro-organisms to digest. Moreover, there is a difference between the lignins of old and young plants; in the younger state the lignins are chemically "tenderer" and easier to break down. Differences in humus formation in the soil are traceable not only to differences in the plant materials that are decomposed but also in the living agents of decay, the bacteria, molds, protozoa and other microscopic forms. Insects, worms and other larger animals that feed on dead wood and leaves also aid by chewing them into more manageable morsels for the smaller creatures. The relative abundance of these micro-organisms is influenced partly by the nature of the dead plant materials themselves, for some of them like wood, others straw, still others dead leaves; and also by such factors as temperature, moisture, soil ventilation and soil acidity or alkalinity.

X-raying plants to produce hereditary changes in their offspring is not limited in its effects to what happens in the immediate outcome. An x-rayed plant may produce offspring with new peculiarities, such as changed leaf-size or flower-colour, which will duly appear in subsequent generations. But these generations may also begin to produce other changes, even without being x-rayed themselves. Changes of this character, and an explanation for them, were described by Professor T. H. Goodspeed, of the University of California, one of the pioneers in the field of x-ray genetics. While the details of the process are highly technical, the essential fact underlying the three types of cellular change is a state of instability, of continuing change, induced in the chromosomes by the first impact of the x-ray bombardment. (*Extract from Science—Supplement—* Vol. 82, No. 2123, pp. 10-13).

## ABSTRACTS

**Effects of Ethylene on Plant Growth Hormone.** *Science.* Vol 82, No. 2156, p. 151. Heteroauxin, or plant growth hormone (B-indolyl-acetic acid) is known to have several effects on plants, including promotion of stem elongation, inhibition of bud growth, stimulation of root formation, production of stem swellings and stimulation of epinastic movements of the leaves. With the exception of the first two, ethylene gas also has these effects.

According to A. E. Hitchcock, ethylene, heteroauxin and other substances all act in essentially the same way. This conclusion is based, apparently, on the similarity of the effects of ethylene to those of heteroauxin. There are many cases, however, where these two substances do not have the same effect.