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Report 1918-20 With the Supplement to the Guide to the Experimental Plots Containing the Yields per Acre Etc.



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Mycological Department Xxxii-xxxv

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The results show that the infestation is slightly less on some varieties than on others. These varieties are, however, too closely related racially, to give striking differences, and the experiments are being continued with other varieties of Beans.

Further investigations are in hand dealing with the effect of the manurial treatment of crops on the degree of the infestation of plants by aphids; the relations between the varying constitution of the cell sap of plants, the food of aphids, and the infestation of plants by them, and the working of the stylets in relation to the cells of plant tissues.

XXXII. W. B. BRIERLEY. "*Some Concepts in Mycology—an attempt at Synthesis.*" Trans. British Mycological Society, 1919. Vol. VI. (part ii.). 204-235.

The paper is divided into two parts which, however, are mutually dependent—the species concept and the concept of the educability of fungi. In the former the thesis is maintained that the morphological characters of an organism are a function of the particular genotype and the environmental conditions, and that the phenotypes of different organisms converge or diverge in constant and definite relation to the physico-chemical factors of the environment. Thus morphological characters are no true criterion of specificity. It is further maintained that the only exact method of species creation and specific determination is by means of quantitative physiological data derived from pure cultural treatment under standardised physico-chemical conditions. In the second part the thesis is put forward that the genotypes of "pure lines" of bacteria and fungi are constant and ineducable, and that genotype changes which have been described are better interpreted in terms of modification, of the selection of strains from a population, of stages in a complex life-cycle, or of segregation from a genetically impure ancestor.

XXXIII. W. B. BRIERLEY. "*On a Form of Botrytis cinerea, with Colourless Sclerotia.*" Phil. Trans. Royal Society of London, 1920. Series B. Vol. 210. 83-114.

The fungus, *Botrytis cinerea*, produces black sclerotia, but in a single spore pedigree culture a colourless sclerotium was formed, which gave rise to a strain having colourless sclerotia. This character proved to be constant. The origin and relationships of this new strain are examined and a comparison made of the morphology and physiology of the colourless derivative with the parent. It is shown that the only apparent character in which the two strains differ is in the absence of pigment in the sclerotial skin.

The nature of the loss of colour is considered in relation to the biochemistry and genetics of albinism. The significance of the colourless form is discussed and the hypothesis brought forward that this and other genotypic changes among fungi are better interpreted in terms of segregation from a genetically impure parent than as true mutations. The possibilities of genetic contamination in sexual and asexual fungi are considered.

- XXXIV. W. B. BRIERLEY. "*Orchid Spot Disease.*" *Gardeners' Chronicle*, 1919. Vol. LXV. No. 1676.

A consideration of the several diseases of orchid leaves included under the name "Orchid Spot"; with notes on methods of treatment.

- XXXV. J. HENDERSON SMITH. "*The Killing of Botrytis Spores by Phenol.*" *Annals of Applied Biology*, 1921. Vol. VIII. No. 1.

It is shown that if *Botrytis* spores be exposed to the action of 0.4 per cent. phenol, the spores do not all die simultaneously, but some die in a few minutes and some not till two or three hours have elapsed. The curve showing the numbers surviving at different times has a sigmoid shape. If the strength of phenol be progressively raised, the curve becomes less and less sigmoid, approaching the logarithmic type of curve. With the same suspension it is possible to obtain either a logarithmic or a sigmoid curve according to the strength of phenol used. Both types of curve are shown to be explicable on the assumption that the individual spores differ in resistance and that a frequency curve showing the distribution in the resistance grades approaches the normal curve. The influence of the number of spores used is shown to be very considerable; and the consecutive transition from the sigmoid to the logarithmic type occurs, whether we raise the phenol strength, keeping the spore number constant, or reduce the spore number keeping the phenol constant, or use younger and younger spores.

TECHNICAL PAPERS.

CROPS AND CROP PRODUCTION.

- XXXVI. WINIFRED E. BRENCHLEY. "*Useful Farm Weeds.*" *Journal of Board of Agriculture*, 1918. Vol. XXV. pp. 949-958.

During the war the deficiency in supplies of every kind led to a revival of interest in the uses to which many farm weeds can be applied. If the need ever became sufficiently urgent, weeds might serve many useful purposes, but with the restoration of more normal conditions most of them have again fallen into disuse.

Weeds have their uses in medicine, as dyes, manures, and as fibre plants, but in times of stress they are most valuable as fodder and human food. Couch grass, spurry, bent grass, nettles, chicory, gorse and poppy cake can all serve as fodder, especially as most of them, in addition to being nutritious, are obtainable in large quantities.

Chicory and "salep" (*Orchis mascula*) are the principal weeds used as human food. Chicory has long been employed as a substitute or adulterant for coffee, while salep enters largely into the diet of people of Turkey, Persia and Syria. Many weeds provide leaves that have been used as substitutes for tea and coffee, and the young tops of nettles, garlic and dandelion have been frequently used as green vegetables by country folk.