

## DOCTOR OF PHILOSOPHY

PH. D.

BIOCHEMISTRY

EVELYN M. ANDERSON

### THE INTERRELATIONSHIP OF THE ANTERIOR PITUITARY AND THE THYROID GLAND.

A study has been made of the physiological properties of the thyreotropic hormone of the anterior pituitary. Evidence of hyperfunction of the thyroid has been shown to occur in the rat and guinea pig following injection of the hormone. The toxins of staphylococcus aureus accentuate the effect of the thyreotropic hormone in the rat. Replacement therapy has been accomplished in the hypophysectomized rat with the thyreotropic hormone. A study has been made of the resistance to the hormone which develops in animals after prolonged injections. A substance which inhibits the action of thyreotropic hormone has been found in the serum of these animals. Animals of several different species have been used. Some of the physiological properties of the antithyreotropic substance have been investigated.

PH. D.

AGRICULTURAL CHEMISTRY

HAMMOND JOHNSON ATKINSON

### ORGANIC MATTER AND ACIDITY IN PODSOL SOILS.

A new method of studying the acidity of the organic matter of podsol soils has been developed. The soil solution is displaced with distilled water from soil placed in glass percolators, concentrated on a steam-bath and dialysed through cellophane. Analysis of the dialysate has shown that up to 50% or more of the acidity may be accounted for as sulphuric and phosphoric acids. At any one time, 100 to 300 lbs. of sulphuric acid and 15 to 50 lbs. of phosphoric acid per acre may be present. Up to 50% of the acidity is non-dialysable. This acid material yields oxalic acid when oxidized below 20° C. with dilute alkaline potassium permanganate.

Field experiments showed that sodium carbonate and sodium hydroxide improved soil conditions and increased crop yields when used in amounts not exceeding one-twelfth of the weight of calcium compounds indicated by "lime requirement" test. Excessive sodium carbonate proved harmful.

PH. D.

CHEMISTRY

ADAM CARR BELL

### THE ADDITION REACTIONS OF PHENYL VINYL KETONE.

Methyl cyanoacetate, cyanoacetamide and malononitrile all gave trimolecular products when added to phenyl vinyl ketone. Nitromethane gave a tetramolecular compound. Methyl cyanoacetate gave methyl 1,5-dibenzoyl-3-cyanopentane-3-carboxylate which, when treated with hydrogen bromide, gave the corresponding amide, an "imide bromide" and methyl 2-bromo-3-( $\beta$ -benzoylethyl)-6-phenyldihydropyridine-3-carboxylate. Hydrolysis and decarboxylation of the same addition product gave 1,5-dibenzoyl-3-cyanopentane. Concentrated sulphuric acid converted the latter into the corresponding amide and 2-keto-3-( $\beta$ -benzoylethyl)-6-phenyltetrahydropyridine. With bromine the cyanopentane gave 2-bromo-3-( $\beta$ -bromo- $\beta$ -benzoylethyl)-6-phenylpyridine in quantitative yield. The last two reactions are characteristic of  $\delta$ -ketonic nitriles.

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CHEMISTRY

IRENE KOERBER BUCKLAND

### PHENOL DERIVATIVES OF LIGNINS.

The phenol condensation products of the "native" lignin found in spruce wood and of lignin isolated by the Freudenberg method have been prepared and their derivatives studied. When wood is extracted with phenol in the presence of hydrochloric acid as catalyst, two chemically different phenol lignins, in approximately equal amounts, are formed. On the other hand, when a previously isolated lignin, namely Freudenberg lignin, is subjected to the same treatment, only one phenol lignin derivative is produced and in a nearly quantitative yield, showing that there is a difference between "native" lignin and an "isolated" lignin.

The results of the present investigation can be correlated by applying the Brauns and Hibbert formula for the native lignin building unit and provide further evidence as to the structural identity of lignin prepared by different methods. The use of phenol derivatives of lignins as reference compounds for the study of lignin has been suggested.