M. Sc. CHEMISTRY

ELWOOD V. WHITE

THE STRUCTURE OF BEECH-WOOD LIGNIN.

The direct acetylation of a prepared beech-wood meal has been carried out with a view to the separation of an acetylated lignin. The maximum solution by acetylation was 76.7% of the lignin present in beech-wood.

A separation of the acetylated lignin in high yield by preferential solvent extraction was not obtained.

The soluble acetylated product was subjected to methylation followed by hydrolysis and a lignin fraction separated. The maximum yield was 24.7% of the lignin present in beech-wood.

The isolated lignin had the same methoxyl content as "Methyl alcohol" lignin isolated from spruce-wood and could be separated into ether soluble and ether insoluble fractions of different methoxyl content.

M. Sc. EXPERIMENTAL MEDICINE

E. WALTER WORKMAN

THE EFFECT OF PARTIAL TRACHEAL OCCLUSION ON THE COMPENSATORY HYPERTROPHY OF AUTOTRANSPLANTS AND REMNANTS OF THE THYROID GLAND.

Experiments have been carried out in guinea pigs to demonstrate that hyperplasia of the thyroid gland and reversion to the colloid phase could be induced by subtotal extirpation of the thyroid gland and partial tracheostenosis. This reversion was observed in the thyroid remnant of the neck; also, in another series of experiments, reversion to the colloid phase took place in the neck remnants and autotransplants. It was concluded that the changes so produced must be due to a blood-borne factor. A "cyclic hypothesis" of thyroid physiology was presented, in which it was stated that the body requirements for thyroxin, the thyreotropic hormone and anti-thyreotropic substance, and the mobilization of iodine in the thyroid gland are all interrelated. On this basis the sequence of events due to subtotal thyroidectomy and after partial tracheostenosis was explained.

MASTER OF ENGINEERING

M. ENG. ELECTRICAL

M. L. DE ANGELIS

REGENERATIVE BRAKING OF ELECTRIC CARS AND LOCOMOTIVES. A STUDY OF ITS FUNDAMENTAL PRINCIPLES AND APPLICATIONS.

This thesis treats of the fundamental principles of regenerative braking as applied to electrically propelled cars and locomotives. It discusses the most important systems used.

The introductory chapter outlines briefly the history of the development of the problem. Chapter II deals with the advantages and disadvantages of this method of braking, shows its possibilities on level and mountain lines and gives the practical results obtained from its adoption on certain railroads. Chapter III describes the fundamental characteristics and requirements of the four principal systems and very particularly the direct current system. The recent application of compound motors on surface line and underground line vehicles is given due consideration. Chapter IV presents a mathematical analysis of the direct current system and gives in detail the method for calculating the speed-braking effort characteristics of a locomotive using a special excitation set. Chapter V concludes the study and gives a bibliography on the subject.

M. ENG. ELECTRICAL

C. B. FISHER

SOME NON-LINEAR VACUUM-TUBE TOPICS.

A number of separate circuit problems in radio engineering are discussed, the problems being linked by the fact that they all involve non-linear impedance relations in vacuum tubes. There is also a general discussion given on non-linearity, and a critical bibliography. Among the topics discussed are: automatic volume control in radio receivers; some original work leading to a vacuum tube wattmeter; original analysis dealing with a heterodyne detector; a constant impedance circuit primarily intended to meet the