

by agreement with the highway departments of the State, have surfaced some of those graded roads. We have found this absolutely necessary in a great deal of this area in order to make the roads serviceable.

Assistant Secretary DUNLAP. How do your costs compare in the construction of roads across the mountains with the cost of State roads?

Mr. BISHOP. The cost of forest highway projects varies greatly, according to the character of the country through which we are building. Through some of those mountain passes, the cost runs up more than it does in more level country, or in some parts outside of the forests.

Colonel GREELEY. The average to date is about \$12,700 per mile.

Mr. BISHOP. I would say, offhand, that our costs would probably compare favorably with the average cost of State roads.

Assistant Secretary DUNLAP. I would say, offhand, that they are less.

Mr. BISHOP. That depends on the locality. I am speaking of the States in which these roads are built.

WEDNESDAY, FEBRUARY 1, 1928.

BUREAU OF CHEMISTRY AND SOILS

STATEMENTS OF DR. HENRY G. KNIGHT, CHIEF; DR. W. W. SKINNER, ASSISTANT CHIEF, CHEMICAL TECHNOLOGY; DR. A. G. M'CALL, SOIL INVESTIGATIONS; DR. F. G. COTTRELL, FERTILIZER INVESTIGATIONS; DR. A. F. WOODS, DIRECTOR OF SCIENTIFIC RESEARCH; MR. D. J. PRICE, IN CHARGE OF DUST EXPLOSION INVESTIGATIONS; AND DR. OSWALD SCHREINER, SOIL FERTILITY INVESTIGATIONS

GENERAL STATEMENT

Mr. DICKINSON. Do you want to make a general statement of the work in the bureau before we take up the individual items?

Doctor KNIGHT. I may make a very short statement.

By act of Congress upon July 1, 1927, the Bureau of Chemistry, the Bureau of Soils, and the Nitrogen Fixation Research Laboratory went out of existence and the Bureau of Chemistry and Soils came into being, combining the work under one administrative head. There was transferred to the new bureau all of the work formerly in the Bureau of Chemistry except the food and drug administration which was transferred to the food, drug, and insecticide administration, the work in the Bureau of Soils, the work in the nitrogen fixation research laboratory and two divisions from the Bureau of Plant Industry, namely the soil fertility and the soil microbiology divisions.

The new bureau as now organized is primarily a research and fact-finding organization covering a rather wide range of important activities, sufficiently wide, in fact, that opportunity is offered to attack problems along rather broad lines and to develop fundamental