Method No. 6—Same as in No. 4, except liquid asphalt (MC-1) was used.

Method No. 7—This subgrade treatment consisted of a 3,300-foot section of three-inch stabilized material course, constructed as a part of the subgrade to form a foundation for the pavement to be constructed upon.

To date, no conclusions have been drawn as to the relative merit of these various treatments.

In other instances, gravel or crushed stone subbase courses with adequate drainage are constructed. Where unstable acid silts or clays are encountered, these soils are greatly improved by treatments with limestone.

Where extremely unstable areas are encountered, containing free water due to stratified soil layers and pockets, and the soils containing the water respond to drainage, a system of subsurface drainage with porous backfill is recommended for the removal of the free water. This type of treatment is very successful. Where these conditions are encountered, soil borings should be made, and soil profiles plotted showing the soil types, their limits, and moisture conditions. After these sketches have been completed, the value of a drainage system can be easily visualized.

Recent improvements and control in soil compaction are playing a very important part in the construction of fills and embankment sections. The State Highway Commission of Indiana, in conjunction with the U. S. Bureau of Public Roads, is contemplating a co-operative project to investigate the possibility of using various types of rollers for compaction, both with and without moisture control.

The above-mentioned items are only a few of the problems for soil studies in connection with highways. The application of soil science to highways has a large scope, and is certainly an item that should not be overlooked in highway improvements, if such improvements are to be made on an economical basis.

PROTECTING TREES ALONG OUR ROADS

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In turning over in my mind the material which I wanted to use on this paper, an incident at the recent contractors' convention at French Lick kept intruding itself in my thoughts.

A well-known contractor, slightly in his cups but still able to navigate, was telling me of some recent experiences he had had in seeding on one of his jobs. And, as is usually the case under the strain of spirits, he would break off in the
middle of a thought and lament the fact that the road contractor was no longer a road man—he had to know everything in the book: seeding, sodding, streamlining slopes, erosion-control measures of all kinds, and—he waxed eloquent, and almost sobbed—he had even had a job planting honeysuckle.

The highway of today has come to that. It is no longer a raw scar left for nature to heal as soon and as best she can. The augmented mileage, the demands of the public for comfort, safety, and pleasure in driving on these roads have created new ideas of what constitutes a highway. The Department of Landscape Design in the Federal Bureau of Roads was created to co-ordinate this work on state and national highways.

Along with the highway aspect, and possibly as important, when all factors are weighed, is the problem of national conservation. It may seem a far cry from the trees along your county roads to the dust storms of the west, but they have a definite and related significance. The future generations will pay for every tree or blade of grass we thoughtlessly or wantonly destroy in this generation. And today, particularly in agricultural areas of the state, the fence rows and roadsides are almost the only areas where our native tree growth is reproducing itself.

Our interest in the trees along your county roads is two-fold. The first lies in the fact that our state roads were once county roads, that evolution of the road naturally throws the major routes of travel into the state and national systems. And the tree is such an unchanging element, is so slow in growth, that even if thirty years elapse before a road is taken into the state system, the damage done today by improper pruning is inherited by the state. The second is the value of a united front of all road officials in checking this damage. Anything which helps a state road helps a county road—and vice versa. The wider the public interest and understanding, the more intelligently any problem can be solved.

GOVERNING LEGISLATION

For your information, I will quote the basic law which governs the right of utilities on all roads of the state:

36-1705 (8701). Poles and Wires.— Corporations now formed or which may hereafter be organized for the purpose of constructing, operating and maintaining telephone lines and telephone exchanges, or for the purpose of generating and distributing electricity for light, heat or power, are authorized to set and maintain their poles, posts, piers, abutments, wires and other appliances or fixtures upon, along, under and across any of the public roads, highways and waters of this state outside of cities and incorporated towns; and individuals owning telephone lines or lines for the transmission of electricity are hereby given the same authority: provided that the
same shall be erected and maintained in such manner as not to incommode the public in the use of such roads, highways and waters: provided further that no trees shall be cut along such roads or highways without the consent of the abutting property-owners: provided also, that no pole or appliance shall be so located as to interfere with the ingress or egress from any premises on said road, highway, or waters: provided further that nothing herein contained shall be construed as depriving the county commissioners of any county of the power to require the relocation of any such pole, poles or appliances which may affect the proper uses of such highway for public travel, for drainage or for the concurrent use of other telephone lines or lines conducting electricity. The location and setting of said poles shall be under the supervision of the board of commissioners of the county. (Acts 1905, ch. 167-38, p. 521; 1911, ch. 161-1, p. 421.)

From this you can readily see that your county officials have as much control over the trees on the county roads as we have on state roads. We have an additional law, providing for a permit, as follows:

Chapter 288, Section 1—Be it enacted by the general assembly of the State of Indiana, That it shall be unlawful for any person intentionally to cut, trim, destroy, injure, molest or remove any tree, shrub, plant or vine within the right of way of any highway in the state highway system of the State of Indiana, outside the corporate limits of any city or town, without the written consent of the State Highway Commission of Indiana. Any person violating the provisions of this act shall be guilty of a misdemeanor and upon conviction shall pay a fine of not less than ten dollars nor more than one hundred dollars.

This does not apply to roads outside the state system.

The attitude of the average utility, and I speak from experience, is to ask everything and do only those things it feels compelled (by regulation or public sentiment) to do. Once an agreement is made with the larger companies, however, they stick by it. This has not been true with some of the smaller companies or the contracting construction companies. The R.E.M.C. construction has done damage in our state this year, the effect of which will be a lasting blot on the beauty of the trees on our highway. And when you stop to think that the roads of this state created so much of the need for electric services, it seems incredible that utilities should be a party to such mutilation of the trees which are a basic part of the value of the highway.

METHODS OF CONTROL

A definite permit for trimming of trees, annual and revocable on cause, issued by the county commissioners is perhaps the surest method of control. There will be objections at first, but once under way it will simplify your problem.
The psychology of a permit brings up the question of responsibility each time it is reviewed in a utility office, and I honestly believe that a great deal of the damage that has been done in the past has resulted from non-realization rather than from an unscrupulous attitude.

No tree should be removed from a highway without a definite written permission granted after all alternatives for saving the tree have been considered. This should be the case particularly when removal of trees of local historical or sentimental value is desired. Each of you can recall trees of this nature in your county.

From the practical standpoint, there are a few broad principles to which we try to adhere in our own work:

1. In pruning any tree, try to preserve its characteristic shape.
2. Do not stub off a branch. Take it off at the junction with a larger limb or trunk. Stubs die and decay and infect the whole tree. Details of the proper method of branch removal are described in a pamphlet which we have prepared for our own field forces.
3. Have old damage cleaned up as utilities do further maintenance pruning.
4. Educate the farmers in proper methods of attaching fences to trees. A print is also available describing the proper method.

You are all familiar with the organization of the state highway department. We have a man in each district office who, if he can be of any service to you, I am sure will be glad to co-operate in any reasonable assistance. The whole problem is common to both your field and mine, and only by a united front can be achieved any degree of success. Whether you plant a tree, or save a tree, the end is the same.

In closing, I would like to quote a paragraph from Bruce Barton:

When I am dead, people may say for a few weeks, "He wrote pieces for the newspapers." For a few years they may say, "He was the father of so and so." But long after that, long after the name is forgotten, there will be a great tree in which birds of the air will make their homes, and under which sons of man will find rest—the trees that I planted. In the life of my trees, I shall lift my face to the sun and cast my shadow upon the earth for a hundred years.