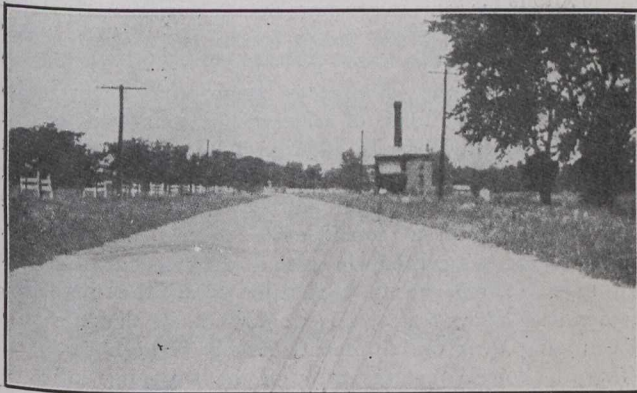


phalt pavement, and even under the weight of the 9-ton engine it showed very little evidence of depression from the wheel calks, and absolutely no trace of any cutting of the surface.

Experiment No. 11—Carbo-Via.

This material is a refined coal tar product. It was applied on a macadam road prepared after the manner of experiment No. 9. The material was heated to a temperature of about 300 deg. F., in the same tank that was used for experiment No. 9, and was poured on the road with hand sprinkling cans. In making the first application about 1½ gallons per square yard were poured. Immediately after the pouring the surface was rolled with a steam roller, the wheels of the roller having been oiled with an emulsion of kerosene and water, to prevent the carbo-via from adhering to the roller. After this rolling, a thin layer of stone chips was swept into the voids, and the surface was again rolled. About ½ gallon of carbo-via per square yard was then applied and rolled as before and covered to a depth of about ¾ inch with stone screenings and dust.



Section XI. Carbo-Via Binder.
Ohio State Experimental Road.

This section is hard and comparatively smooth, as is shown in paragraph 11, not entirely free from dust.

Experiment No. 12—Concrete Macadam.

The construction of this section was practically the same as that of a water-bound macadam road, except that Portland cement was mixed with the screenings for the binder of the top course, with the expectation of increasing the cementing power of the stone dust. The cement was mixed with the dry screenings in the proportion of one part cement to six parts of screenings. The mixing was done by hand on board platforms placed at the side of the road, the mixture being turned until it was of a uniform color. Upon the lower course of macadam, which had been shaped, rolled and thoroughly bonded, was spread a layer of limestone varying in size from 1½ to 3 inches, to a depth of about 3 inches. After this course had been thoroughly rolled, the above described filler was applied dry, using a spreading motion of the shovel, the rolling being continued during the process of filling until all the voids were completely filled. Water was then applied and the rolling continued until a wave of grout was produced in front of the roller over the entire surface. This section was closed against travel and the surface was kept damp by repeated sprinklings for several days after the work had been completed.

This section has much the appearance of water-bound macadam; in fact, the addition of the cement seems to have added nothing to the merits of the road. An excess of dust made it necessary to treat the surface with calcium chloride.

Experiment No. 13—Taroid.

Taroid is described by the manufacturers as being "a coal tar pitch prepared in liquidized form as a binder." The

lower course, or base, for this section was shaped up with rather small size stone, filled and thoroughly rolled. The stone for the top course varied in size from 3½ inches to 1½ inches. This stone was spread to a depth of about 3 inches. The method of treatment was similar to section No. 3. From 1 to 1½ gallons of hot taroid was poured on each square yard of surface. This pouring was done by hand, 4-gallon galvanized pouring cans, equipped with fan-shaped nozzles, being used. After the taroid had partly cooled the surface was well rolled. Coarse torpedo sand was then spread over the entire surface and the road was again rolled, which completed the treatment.

An excess of tar has resulted in "bleeding," both on the surface and at the sides of the roadway. The surface is not entirely smooth, by reason of the fact that the tar has not been forced to the surface uniformly, but has come out in such a way as to form small ridges or knobs on the surface.

Experiment No. 14—Petroolithic Pavement.

This process of road treatment was introduced by the Petroolithic Pavement Company, of Los Angeles, Cal., who incorporate a heavy asphaltic oil into the road material by means of various tools and devices, some of which are patented by the company. The tamping roller is an important factor in the construction of this type of roadway. It consists of a roller about 3 feet in diameter whose surface is studded with iron teeth 9 inches in length and having an end area of about 4 square inches. The action of these teeth on the road material is said to approximate that of a flock of sheep, and to produce a tamping, puddling and kneading action which compacts the lower portion first and gradually works the material into so compact a mass that the teeth or feet of the roller will finally ride on the surface without penetrating or indenting the roadway. The old macadam roadway where this section was constructed was first broken up with a rooter pulled by a steam roller and the loosening completed by turning with a common road plow pulled by horses. The loose stone was then smoothed with a heavy "A" harrow. The California liquid asphalt heated to a temperature of 200 deg. Fahrenheit was then applied by means of a Petroolithic Glover road oiler. Three applications of one gallon each per square yard were made. The mass was then mixed by means of the petroolithic road cultivator and tamped and compacted by means of the petroolithic rolling tamper. A road grader was used to crown and shape the roadway. After the work of tamping had been completed a small amount of limestone screening was applied and the surface was smoothed with a steam roller. A fourth application of the asphalt consisting of about one-half gallon per square yard was used, the surface covered with limestone screenings and again rolled.

During the summer following the construction of this road, the asphalt was forced to the surface to a degree that it became very objectionable and vehicles chose to travel at the side of the road rather than over the roadway. The highway department caused a course of screened gravel to be rolled into the road in an effort to make the road passable. At the present time, in spite of this treatment, the road is in wretched condition. It is so soft that it shows the imprint of a shoe heel when walking over the surface and the traction engine had cut in so deeply as to make even the imprint of the tires plainly marked. The road surface is spongy and deeply rutted.

Experiment No. 15—Limestone Concrete.

This section was constructed of concrete made of crushed limestone and Portland cement rolled in place with a steam roller. The foundation was prepared by grading and shaping the old macadam road to give it the cross-section desired for the surface of the finished work. It was well