

## TREATED WOOD BLOCK PAVING.

THE Forest Products Laboratories, recently established as a division of the Forestry Branch of the Department of the Interior, have under consideration an extended investigation of the possibilities of treated wood blocks for road paving, dealing with the relative merits of different native woods, details of seasoning and preservative treatment and methods of laying, having particular regard to the climatic and traffic conditions to be met in Canadian cities. It is the intention of this department to place under close observation several stretches of wood-block paving which are subject to representative conditions of service, in the hope of obtaining more or less direct correlation between the data gathered from periodical inspections and the results of laboratory investigations.

Pending the completion of such parts of this undertaking as will justify the publication of further reports, the Laboratories have issued a bulletin which is largely a compilation of the information available to date and a summary of the published work of other investigators. We extract the following from the bulletin:

Apparently the first use of wood blocks for road-making, according to authentic records, was in Russia several centuries ago. In England and the United States wood-block pavements were adopted in a small way about eighty years ago. The record of such paving was far from satisfactory; in all cases the blocks were untreated, and in earliest practice were merely sawn from the log and laid as closely as this form would permit. Such paving was quite widely used in the Western States and in some Canadian cities, more particularly before the adoption of brick and asphalt surfaces. The foundation in most cases was of untreated planks, which after a short service decayed, permitting unequal subsidence of the blocks. In the case of round blocks the traffic wear was concentrated at the edges, and the interstices were collecting places for water and street refuse. Under such conditions the pavement soon became unsanitary, and deterioration was very rapid. Later, rectangular blocks were adopted with some improvement, but absorption of water was a cause of trouble, and after appreciable wear and settling of the foundation, it was practically impossible to maintain the condition of the surface. In part these early difficulties may have arisen from the indiscriminate use of woods most easily available, but the rapid decay was largely due to absorption of water and the collection of organic refuse around the blocks. In America, during comparatively early practice, a great many varieties of native woods were used for paving service. In London, England, particularly, and to some extent in New York, Australian wood was introduced, but in general the cost of such pavement was prohibitive, and the results not satisfactory. The woods so imported were chiefly of two species of eucalyptus, and were of hard dense structure, and their durability was supposed to have been due to some extent to their content of certain antiseptic gums.

Although the successful practical introduction of preservative treatment for timber dates from quite early in the last century, apparently its first adoption in connection with wood paving-block manufacture was about forty years ago. A case is noted of the laying of creosoted-block pavement in Galveston in 1873. The wood used in this case was southern pine, and, while the pavement was not laid in accordance with what is now recognized as

best practice, it gave excellent results, and lasted until its destruction in the flood of 1900.

Briefly, the processes of wood preservation which have survived the tests of practice are: (1) kyanizing, (2) burnettizing, (3) creosoting, and (4) treatment with crude petroleum. The former, so-called from the inventor, Kyan, was introduced in England in 1832. The method as first employed was the immersion of timber in a solution of mercuric chloride, a subsequent modification of the process providing for more rapid impregnation under pressure. In 1838 Sir William Burnett published a method of preservative treatment based on the antiseptic properties of zinc chloride. Pressure impregnation was also later applied to this process. Creosote oil—the heavy oil of tar—first made its appearance as a wood preservative in 1837, and in 1838 was used by John Bethell by injecting under pressure. The use of petroleum oils is of comparatively recent adoption. However, in modern practice this latter treatment is not so widely used as creosoting and burnettizing. Mercuric chloride and zinc chloride are both in use at the present time as wood preservatives, but the latter, because of its somewhat lower cost based on the quantities necessary for effective treatment, has been more extensively adopted than the corrosive sublimate. More recently, sodium fluoride and other fluorine compounds have been adopted as wood-preservative agents to a considerable extent in Europe. The antiseptic properties of sodium fluoride are relatively high, and it is probable that further experience will indicate that under certain conditions it is well adapted for such use. However, because of the solubility of these preservative agents, timber so treated is only available for conditions of service where it will not be exposed to excessive moisture, since otherwise the salts would be partially leached out and the value of the treatment greatly reduced. Moreover, it is essential that wood blocks to be used for paving purposes shall be as nearly as possible impervious to water; otherwise serious troubles will develop due to swelling and buckling of the pavement. Obviously impregnation with a water solution is of no value as a waterproofing treatment. These limitations preclude the adoption of such methods for paving-block treatment.

Treatment with creosote oil or heavier tar products is, therefore, practically the only method applicable for paving-block manufacture. During recent years very considerable progress has been made in all lines of the timber-preservation industry both in Europe and the United States. Improvements in method of treatment, perfection of mechanical equipment used, the careful study of such factors as selection and seasoning of woods, and design and methods of laying pavement have combined to bring the development of wood-paving practice to a point where its adoption may no longer be considered an experiment, and where its possibilities in modern city-street paving merit most careful study.

**Method of Laying Blocks on Concrete Base.**—In England the custom is to lay the blocks in courses at 90 degrees to the street line, and with staggered joints. They are placed directly on the smooth concrete surface, and, after laying, a heated coal-tar-pitch filler is applied, and squeegeed into the joints. This is flushed with a comparatively thin Portland cement mortar wash, and later a surface dressing of clean coarse sand is applied, and left to be worn in by traffic. This method of construction requires, of course, that the blocks be sawn to an absolutely uniform depth. Longitudinal expansion joints of 1-inch