crust, even if the impregnation is fairly deep, as subsequent wetting of the crust brings the glutrin gradually to the surface. Under some conditions the use of glutrin as a dust preventive has been fairly successful.

The most successful of the materials used for either the prevention or suppression of dust on roadways are the bituminous materials, and they can generally be used for both purposes.

If the voids in the road metal are, for instance, filled with bituminous materials, the internal production of dust is prevented. The external production of dust even may also be reduced because of the cushioning effect of the pitchy matrix and the greater resiliency thus given the piece of road metal subjected to the shock or attrition of traffic. If the bituminous material is only applied to the surface of the road crust, it still reduces the dust nuisance by suppressing the raising of the dust underneath or mixed with it, and in many cases by protecting the road metal from any superficial wear from traffic.

Further, a proper bituminous material possesses to a large degree, and greater than in the cases of other materials, the ability to absorb a considerable amount of dust produced elsewhere, and, perhaps, brought on to the roadway through various agencies. This is important roadway through various agencies. from the economic point of view.

What is a "proper" bituminous material will depend so largely, in any case, upon the local conditions that no close definitions can be given in this paper. Perhaps it might be said that, generally speaking, the asphaltic oils are better for this work than the paraffin base oils, that a good bituminous dust layer will give benefits other than the mere reduction of dustiness on the roadway—such, for instance, as the reduction of noisiness and an increase in sanitariness—and that usually its proper application will be in the interests of both economy and general satisfaction satisfaction.

On the other hand, the improper use of an unsuitable bituminous material will produce results on the roadway second to none as far as nastiness and general dissatisfaction are concerned.

Discussion by Mr. A. T. Laing,

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The dust problem, like many other road problems in its present acute form, dates from the introduction of the self-propelled vehicle. This innovation in the methods of transportation brought about conditions as to load traction and velocity that formerly were little dreamed of. All three features mentioned have a direct bearing on the question under consideration. The heavy load of the motor the motor the transformation and the produces as Motor truck not only breaks up the crest but produces as Well internal attrition in the road metal and the fine material works to the surface to form dust. In addition to this, the driving power of the engine is transmitted to the period the periphery of the wheel, thus producing a shearing or grinding effect on the road surface and then the speed of the passing car finishes the work begun by the other two agencies and we have the results which are so disastrous to the roads, add so much to the discomfort of the traveller

and which are such a menace to health.

The dust problem is two-fold in character. First, that of mitigating the evil by treating the dust with a Palliating Palliative or a dust layer, and second, that of treating the surface in such a way as to prevent as far as possible the formation of dust. These features should have careful consideration in determining which method is to be employed in a given case. In all probability we will, for some time at least, have to resort to the use of palliatives in many cases and at this point the question becomes com-The climate, the volume and nature of the plicated. traffic all have a bearing, and added to this is the fact that there are on the market a great number of compounds from which a selection must be made and, as Major Crosby has pointed out, conditions vary so that there is no best material or method. It becomes highly important, therefore, at this point that the advice should be sought of one who has a thorough knowledge of the subject. Major Crosby states in his paper that of all the materials on the market the bituminous compounds are generally the most satisfactory. This may seem simple, but it is in reality a very complex matter as there is such an infinite variety of these compounds. One important characteristic of any such compound is that it should have strong cohesive properties. As the presence of paraffin will reduce this property an oil low in paraffin content is to be preferred. It is also undesirable that there should be present a high percentage of sulphur. A high percentage of low boiling products may be the source of unpleasant odors and will necessitate more frequent treatments. The ingredient to be desired is asphalt, but this must be fluxed with oils that will keep it in a plastic condition and at the same time render it convenient to handle. It will be seen, therefore, that even though a decision may have been made in favor of bituminous as against other compounds the selection of the particular bituminous mixture is not a simple matter and the aid of the chemist or expert should be sought. It is desirable that the kind that is used should be cumulative in its effect.

As regards the second phase of the question, that of treating the surface so that it will not yield dust, it is one very largely of the selection of the bituminous materials employed. The economic value of such a method commends itself as one is thereby preserving the road and we come to the point where it is difficult to differentiate between dust prevention and maintenance.

Dust is deterioration, and the extent to which we eliminate its formation do we contribute to the maintenance. In this latter question the nature of the traffic will have a direct bearing. The mat surface produced by using bituminous materials with gravel gives highly satisfactory results for automobile traffic, whereas it might fail under the shoes of horses and narrow-tired vehicles.

Much might be said, if time would permit, regarding methods of application, the temperature of the compound and the comparison of hot applications with cold. It would be interesting if this discussion would bring out some of these points.

The 11th unit has been installed in the plant of the Electrical Development Company, at Niagara Falls, Ont. This completes the equipment of this plant. The capacity of the machinery now installed in the plant is rated at 147,-000 h.p., all of which is to be used in Toronto. The last generator was started on February 15. The first machine, a generator of 13,000 h.p., was installed on No-vember 1, 1906. Four of this type of generators were in-stalled after which the size was increased to 15,000 h.p. vember 1, 1906. Four of this type of generators were in-stalled, after which the size was increased to 15,000 h.p., and seven of these machines have been installed. The gen-erators are manufactured by the Canadian General Electric Company, while the wheels are of the I. P. Morris type. The company was chartered to generate a maximum of 125,000 h.p. and the extra machinery is installed to protect the com-pany in case of a breakdown. This plant is the first of the Canadian power plants at Niagara Falls to be equipped up to Canadian power plants at Niagara Falls to be equipped up to its maximum capacity.