directed to the question, which thus resolved itself into matter of spring suspension.

In the earliest days when the speed attainable by motor-cars was barely greater than that of the horse-drawn vehicle, the principal vibration emanated from the engine itself, owing to the small number of cylinders used, the weight of the moving parts and the lack of proper "balancing"; in fact, many of the earlier engines fitted to road vehicles literally "shook themselves to pieces."

As, however, the art of correct "balancing" in internal combustion engines began to be mastered, and also the use of lock nuts and split pins became universal, the trouble from mere vibration was greatly diminished, but the breakages from road shocks became more serious as the speeds increased.

The method of suspension used on modern motor-cars—the long springs on a long wheel-base, the use of the transverse or "three-quarter elliptical" in addition to the ordinary rear springs, and the various "dampers" or shock-absorbers—is as perfect as we are likely to have with the present road surfaces; more cannot be done by the motor builder. It therefore rests with the road builder to effect further improvements which will increase the life of the vehicle and the comfort of the passengers.

Good as now is the springing of a motor-car, it is as nothing compared to what would be possible with universally improved road surfaces. At the present time the frames, axles and other essential parts have to be constructed far heavier to withstand the strains than ought really to be necessary. The shocks to which the various parts of an automobile are subjected when the latter is driven fast over an indifferent road surface are very severe, and in course of time they affect the machinery in numerous ways, by increasing the wear in the main bearings of the engine and of the transmission—especially the bearings connected with the back axle in the case of chainless cars—by causing excessive wear in the universal couplings of propelling shafts, in the pins and pivots of the radius rods and torque rods, spring shackles, steering pins, etc. The constant "pounding" also causes the axles to become gradually brittle, so that they have to be built with a bigger factor of safety than would be necessary on a really smooth surface.

With ideal roads, not only could the whole car be constructed far lighter in weight, but especially those parts which are situated between the springs and the road surface—e.g., wheels, axles, steering gear, etc. These parts, if reduced in weight, would respond more readily to any slight unevenness, whereas at present their inertia is such that when travelling fast they have not time to respond to each "bump" in the road, with the result that they simply bound up and down in a manner suitable to the "period" of the springs, and not in true accordance with the inequalities of the surface; shock dampers also have often to be fitted to check the excessive rebounding of the springs.

With a general reduction of weight such as would follow the advent of smooth roads, far more sensitive springs could be used, with corresponding increase in comfort and luxury of travelling, and in the life of the vehicle and its mechanism.

While dealing with the subject of road shocks, attention might here be drawn to the severe and wholly unnecessary jolting that is often caused to motor-cars and their occupants by the bad joining up of different repaired strips of road surface, when encountered at high speed; these shocks could be very greatly reduced by the simple method of making the joins diagonally to the road instead of at right angles to it. By this means the bump would be encountered by each road wheel successively and separately, instead of by the two front wheels simultaneously, and then by the two back wheels together.

Among other considerations of importance in regard to the nature of the road surface is the degree of adherence afforded to pneumatic tyres by the surface. There are certain materials used such as oolite and various chalky substances, which make an excellent surface when dry, but which become very slippery in wet weather, and which should therefore, from the motor-car's point of view, be avoided if possible, or mixed with other more gritty substances. Apart from the question of danger, the continuous driving of a powerful vehicle over a very slippery surface is liable to cause excessive wear and tear in the differential gear.

Another matter, and one which helps to emphasize the importance of aiming at dustless roads, is that not a little of the wear and tear in the various bearings of motor-car mechanism is traceable to grit, sand, and in fact fine particles of stone, which are drawn up from the road surface by fast-moving vehicles.

Finally, in regard to tyres, so much is now known as to the effect of different kinds of road surface upon the life of a tyre that comment thereon is not here necessary; but one point of importance may be mentioned, and that is that with the ever-increasing use of fast-moving mechanical road vehicles it is hoped it will now be but a matter of time before the practice of "banking" all highways at bends and corners will be introduced. This practice, besides reducing considerably the dangers of the highway at certain points would reduce to an enormous extent the amount of wear and tear, both in the tyres and in the side-thrust bearings of the road wheels and axles.

CARBOLINEUM WOOD BLOCK.

Carbolineum wood block pavement on a six-inch concrete base was laid last year on Namayo Avenue and on First Street in Edmonton, Alta. This was the same class of wood block as laid in 1907 on MacDougall Avenue, except that this time some changes were made in the method of laying. In 1907 the sub-foundation was not rolled before depositing the concrete foundation, and in laying the blocks no provision was made for expansion. In the spring of 1907 at several places on MacDougall Avenue the blocks heaved, due to expansion. Last year the sub-foundation was thoroughly rolled and consolidated before depositing the concrete foundation, and expansion of the blocks was provided for by leaving an expansion joint one inch wide between the gutter and the pavement. This joint was filled half way up with sand and the balance of the way with bitumen. Similar joints were left crosswise of the street every hundred feet. Thus far these pavements have given no trouble due to heaving, and I do not think will do so in future, as these joints will undoubtedly provide for any expansion that may take place in the blocks. The blocks used in this pavement are British Columbia fir, supplied by the W. H. Harvey Co., of Vancouver. The dimensions of the blocks are 4-inch by 3-inch and of varying width. This pavement carries a ten-year guarantee, and cost on a six-inch concrete base $3.65 per square yard.

NEW INCORPORATIONS.

British Columbia.—Ingenika-Finlay River Development Company, $2,000,000.

Richmond, Ont.—Malahide & Bayham Telephone Co-operative Association, $10,125.

Westmount, Que.—Westmount Plumbing & Heating Company, $90,000; W. A. Rousseau, J. Gignere, M. A. Cardinal.

Listowel, Ont.—Oliphant Oil and Gas Company, $22,500; T. J. Walsh, Amabel Township; J. H. McCorkindale, Owen Sound; J. C. Hamilton, Listowel.

Hamilton, Ont.—Midfield Natural Gas Company, $40,000; A. S. Devine, C. C. Foote, M. H. Little. Canadian Road Machine Co., $60,000; R. Mancill, C. Walters, W. Bell.

New Brunswick.—Sovereign Coal Company, $300,000; A. Mehler, New York; H. Shaw, Beersville; E. Mead, Adamsville. Kent Coal Company, $5,000; H. Von Hagen, New York; E. Mead, Adamsville; E. O. Seeley, Maccan.

Montreal, Que.—J & T. Bell, $300,000; J. T. Hagar, E. J. Hagar, C. B. Keenan. Canadian Crown Castings Company, $199,000; F. M. Gibson, M. M. Tinsley, G. L. Gillon. Western Engineering Company, $100,000; A. J. Brown, R. O. McMutry, F. G. Bush.