the other hand, the author submits that if some such scheme for the improvement of roads required for heavy traffic as that already outlined is adopted, this question becomes one of quite secondary importance. The following remarks are based upon the latter assumption.

In the author's opinion the most destructive factors so far as roads are concerned are high speed and small wheels, combined with heavy loading. Even exceptionally heavy loads on wheels of large diameter and reasonable width, travelling at a slow rate, cause very little damage to macadam roads in fair condition, except immediately after a frost, whereas fast traffic on small wheels and with much lighter loads soon causes considerable damage.

It must, moreover, be borne in mind that the better and more regular the surfaces of the roads the smaller the damage, even with this type of traffic, and the damage increases at an alarming rate as the surface becomes worn and uneven.

Given, therefore, a foundation of sufficient strength to carry the weight of traffic brought upon the road, and a wearing coat of material which will retain a smooth and even surface, the factors referred to will not greatly affect the rate of wear.

Under these circumstances it appears to the author that the present restrictive regulations might, to a large extent, be repealed, and that the construction, speed, and loading might be taken into consideration in framing the graduated tax previously suggested. In his opinion more would be gained by encouraging manufacturers to design vehicles which are least likely to cause damage, and carriers to use them in the least objectionable manner, by a direct monetary concession than by imposing arbitrary restrictions which might interfere unduly with important industries.

The author suggests a system of taxation somewhat on the lines of the following formula :—

Standard wheels, 36 inches in diameter.

Tires, non-resilient.

W = greater axle weight (tons).

W^1 = smaller axle weight (tons).

S = maximum speed (miles per hour).

T = annual tax in respect of greater axle weight.

T^1 = annual tax in respect of smaller axle weight.

$T + T^1$ = total annual tax.

A = 5s., B = 1s. 3d. when maximum weight of loaded vehicle does not exceed 7 tons.

A = 6s. 8d., B = 1s. 8d. when maximum weight of loaded vehicle does not exceed 12 tons.

Total tax to be reduced by 15s. for every 1 in. increase in diameter of wheels over 36 ins., in respect of each pair of wheels so increased in diameter.

Total tax to be increased by 30s. for every 1 in. decrease in diameter of wheels under 36 in., in respect of each pair of wheels.

The effect aimed at by this suggested basis of taxation is the encouragement of even distribution of weight, moderate speeds and loading, and of the use of large diameter wheels, without unduly restricting the use of any vehicles which may be necessary for the proper and efficient development and carrying on of any industry.

The following table gives typical examples of the application of the formula :—

Maximum weight of loaded vehicle.	W	W¹	S	T	T¹ £ s. d.	Total tax. £ s. d.
7 tons	4	3	10	10	1 17 6	11 17 6
	6	1	10	15	0 12 6	15 12 6
12 "	6	6	6	12	3 0 0	15 0 0
	6	6	9	18	4 10 0	22 10 0
	9	3	6	18	1 10 0	19 10 0
	9	3	9	27	2 5 0	29 5 0

It is suggested that the width of the tire should be proportionate to the maximum load upon and the diameter of the wheels, on the lines of the present regulations.

There appears to be considerable difference of opinion as to the relative amount of damage caused by steel and rubber-tired wheels. It cannot be disputed that rubber-tired motor 'buses are most destructive to ordinary macadam roads, and they also appear to have a damaging effect on roads of higher grades.

The author suggests that the cause of this is probably to be found mainly in the high speeds and small diameter wheels employed. This phase of the question appears to be one which might very usefully form the subject of special investigation.

It is generally agreed that cross-bars should not be allowed on steel tires, but that, if the grip with smooth tires is insufficient, the surface of the tires themselves should be grooved.

The author suggests that all questions as to the construction, etc., of heavy motors is one which should be investigated and considered by a joint committee of road engineers, manufacturers, and users, who should report to the authority empowered to make regulations affecting vehicles of this character.

In conclusion, the author would again emphasize the importance of taking a broad view of the subject. Industrial competition after the war may very likely be as keen or keener than ever, and it is an undoubted fact that improved transport facilities mean increased national prosperity.

PRODUCTION COSTS IN MINING.

It is almost impossible to establish a standard unit of production costs in mining, as is possible in other lines of industry because of meeting new conditions all the time, and because the supervision of efficiency experts or foremen cannot be constant as in a factory, where a great many men are working close to each other in the same room. It is pointed out by the Mining and Engineering World that in well-developed mines where the ore is regularly blocked out, and sufficient reserves are in sight for all requirements for some time to come, and where a certain known tonnage has to be mined month by month, it may be possible to approximate future production costs, such approximation being subject to all the hazards of mining. Such a well-developed mine is an exception rather than the rule; consequently in the majority of mines the bookkeeper or accountant plays a very important part in any scheme for increasing the output or lowering the cost of production. Each individual mine will have to work out its own efficiency plans, for except with big companies who operate more than one property, a comparison of the detailed costs of the different branches of mining will not help much, even if one could get them.