

quick as my ears were, they told of no hoofs upon the road behind me. I turned round in my saddle and could shape nothing out of the darkness of the hollow. The road seemed to be deserted—not so much as a single horseman rode between me and the farm I had passed. Anon, when my silly mare began to pant and to stagger, and stood quite still at last with scarce strength enough to keep upon her legs, I looked down from the little height of the hill and observed the troopers still riding slowly toward the town of Epping—but two of them were dismounted, and seemed to be quarrelling, while a third was talking to a wench who had run after him from the farm. I knew then that the wildest trick man ever played had been capped with success, and, giddy with the excitement and the pleasure of it, I laughed aloud for joy.

"A Hugh! Hugh!" cried I, "to-morrow shall see me at Windsor—to-morrow, to-morrow——"

"Dost thou shout like that, sir," answered a voice from the further side of the hedge; "to-morrow will see thy heels in the air. Put bit upon thy tongue, man. Here is Master Ford crossing the fallow with them

that saved us to-night—no others than Captain Goulding and Keeper Morley, who planned yon pretty trick in the hollow. Lord's mercy! there were but three of them in all, and yet, with their muskets and their horns, they must play the part of a king's company. Pillars of grace! I have been near to a laugh upon it!"

It was old Gideon who spoke, he having ridden to the hill-top by the short cut out of the wood. And when he stood by my side, and I had told him of my ride, and pointed to the tipsy troopers below, I asked him for a further word about his news.

"Who, then, is Captain Goulding, that he should help Hugh Peters?" said I.

"Out upon thee for a simpleton," he answered; but after a minute he said—"yet, how shouldst thou know?—nay, 'tis for love of little Marjory, sir, whom they say he is to marry at Whitsun."

"How, Gideon," cried I; "he is to marry——"

But I could say no more, for his words seemed to strike me like a blow, and all the ground went whirling round before my eyes.

(To be continued.)



BY J. MUNRO . G.E

Shipton was born. "We will be able to construct machines," he wrote, "which will propel large ships with greater speed than a whole garrison of rowers, and which will need only one pilot to direct them; we will be able to propel carriages with incredible speed without the assistance of any animal; and we will be able to make machines which, by means of wings, will enable us to fly in the air like birds."

The idea of mechanical carriages was itself "in the air" during succeeding centuries, and the great Sir Isaac Newton designed a steam coach of a very simple order in the year 1680.

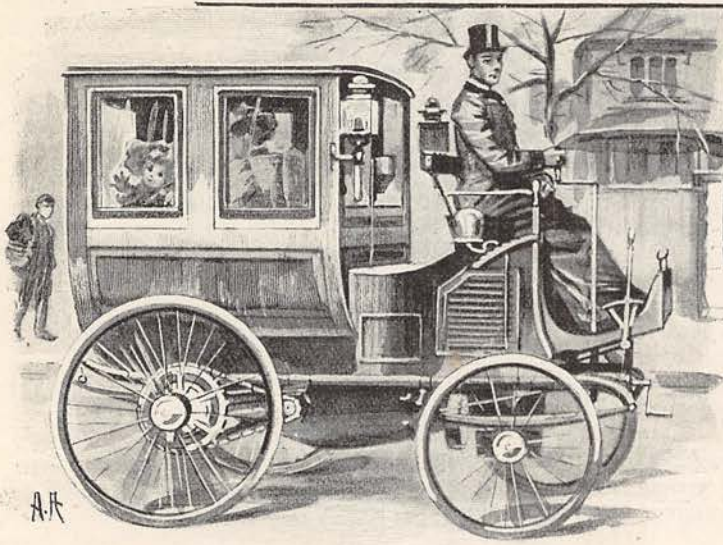
But it was not until 1763 that Nicholas Cugnot, a French inventor, actually made one



CARRIAGES without horses!"

The phrase occurs in a popular rhyme, which is held to be a prophecy of Mother Shipton, the wise woman of Yorkshire, but is really of doubtful and perhaps recent origin. In any case, the advent of horseless carriages was predicted by Friar Bacon six hundred years ago, that is to say, two centuries before Mother





TO AND FROM THE STATION.

which carried four passengers along the streets of Paris at a speed of two and a quarter miles an hour, to the amazement of the multitude. In turning the corner of a street near what is now the Madeleine, however, the plucky little engine fell over on its side with a loud crash, and was promptly "run in" by the bold *gens d'armes*. The experiments were stopped and the machine finally relegated to the museum of the Conservatoire des Arts et Métiers, where it can still be seen. Cugnot himself, like many another pioneer of science, was imprisoned, and afterwards endured miserable privations, until he was relieved by Napoleon I.

This fascinating problem then occupied the minds of Benjamin Franklin, James Watt, Dr. Erasmus Darwin, William Murdoch, inventor of gas lighting, and many others. Murdoch built a working model, which was tried at Redruth, Cornwall, in 1784; and the famous Richard Trevithick, his assistant, made a carriage which ran in London at a speed of ten miles an hour.

Among later inventors, James Nasmyth in 1827 ran a steam coach on the Queensferry Road at Edinburgh; and, above all, Hancock, of London, constructed many coaches and brakes, which plied for months between London, Romford, and other towns, carrying thousands of passengers sixty years ago.

These and other brave attempts aroused the opposition of horse and land owners, and in 1862 an Act was passed prohibiting sham engines from travelling at a greater speed than four miles an hour on public highways. This measure has seriously checked the development of horseless carriages in the United Kingdom, but it did not prevent Mr. R. W. Thompson, of Edinburgh, from introducing the slow steam traction engine, or road locomotive, and the indiarubber tyre.

But how were they "managing in France"? Here the self-moving carriage has been brought into practical use within recent years. In 1888 Serpollet and others devised steam carriages so

convenient and safe that they were permitted to travel through the streets of Paris at a speed of ten miles an hour. In England electricity was applied to the propulsion of dog-carts and bath-chairs by Mr. Magnus Volk, of Brighton, but only on a small scale.

Within the last few years, however, a great impetus has been given to the subject by the invention of the Daimler motor, a kind of gas engine in which the piston is driven up and down in the cylinder, not by the admission of steam under pressure, but by small



AN OLD PROBLEM SOLVED AT LAST.





NO DRIVER AS WELL AS NO HORSE.

explosions of the vapour of rectified petroleum, such as gasoline or benzine. A supply of the petroleum to last out the journey is carried in a reservoir and fed to the motor engine, in which it is exploded under the piston by means of a flame or the electric spark from a small induction coil excited by a voltaic battery, and the motion of the piston is communicated to the wheels of the carriage by suitable gearing.

The long-distance race of these "automobile" carriages from Paris to Bordeaux and back has proved the superiority of the petroleum over the steam carriage, which may now be regarded as out-of-date. The "struggle for existence," terminating in the "survival of the fittest," will henceforth lie between the electric and the petroleum carriage.

For the benefit of those who may be thinking of investing in an "auto-car," it will be useful to consider these two kinds in relation to each other and to the ordinary horse-carriage.

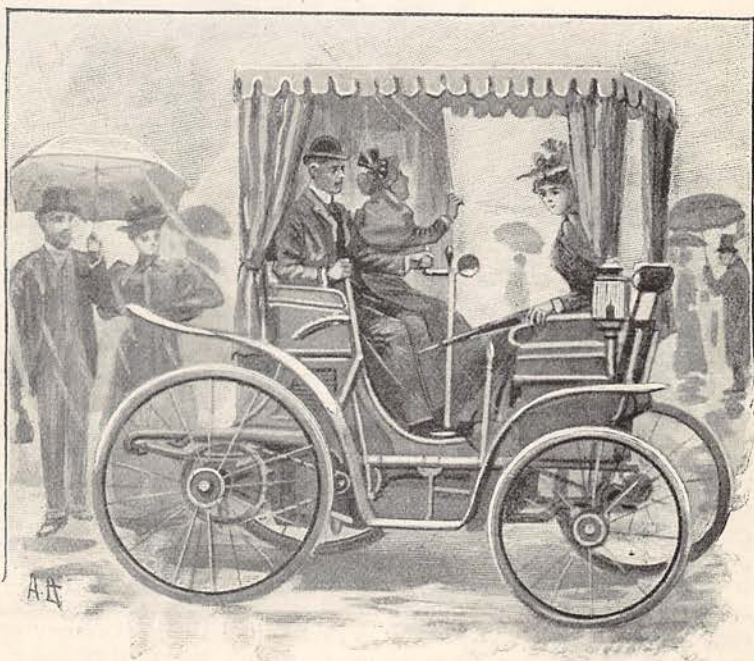
The horse, as a

beautiful and intelligent creature, and often an affectionate friend, is, of course, more interesting than a lifeless mechanism, and it is not to be supposed that he will be entirely driven from the field; but, on the other hand, the horse is often ill-treated and over-wrought, his life is made a burden to him by cruel or thoughtless masters, and no one can deny that where mechanical power can do the work of suffering flesh and blood it should be allowed to do it.

Moreover, the horse is subject to illness, and is frequently dangerous through fright; but there is no fear of an auto-car "shieing" on the road, and although the motor might break down or the petroleum reservoir explode, these contingencies are somewhat remote.

In case the injury to the motor is such that an ordinary blacksmith or working engineer could not repair it, the motor could easily be made detachable and sent to the manufacturer for amendment.

It is probable, however, that makers will provide against such a mishap by supplying spare parts with which an intelligent smith can replace the broken ones in a very short time.



SHOWER-PROOF.

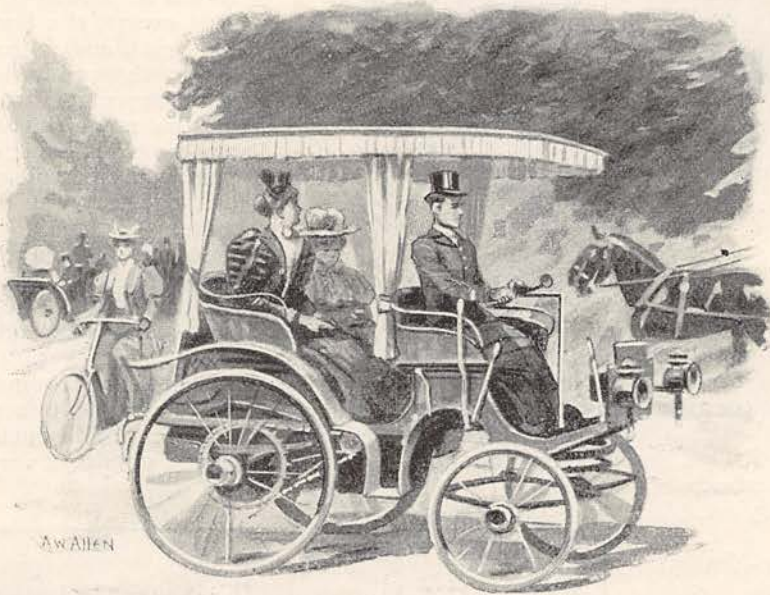


Even now the danger of explosion is reduced to something very small, by removing the reservoir as far as possible from the igniting apparatus, and still further improvements will doubtless be made in this respect.

The electric car is, of course, quite free from any such danger, since the motive mechanism consists of an electric motor, fed by the current of an accumulator or a primary battery stowed in the car, under the box-seat, or elsewhere. Should the apparatus break down, the services of a practical electrician

fixed stations, where the batteries can be replenished without much trouble.

Coming now to the important matter of cost and maintenance, the auto-cars are much more expensive to buy than horse carriages, owing to the motor and gearing; but they are easier to maintain. The price of an auto-car ranges from £150 to £300, according to its size and beauty; but the cost of a mile of travel varies from a halfpenny to a penny. A ten-mile drive can be enjoyed for sixpence or a shilling, and it must be borne in mind that neither



THE PARK, AS IT WILL BE.

would have to be called in or the apparatus disconnected and sent to the makers.

This question of breakdown is, however, a secondary one, and will not deter people in general from getting an auto-car if the ordinary working advantages justify them.

Electric carriages are even now almost entirely free from vibration, and they will be made still freer in future. The great advantage of the petroleum car over the electric one is that sufficient fuel or rectified petroleum for a long journey can be carried in smaller bulk and weight than a supply of electricity. Moreover, it is much easier to procure a fresh supply of petroleum than electricity. The petroleum car is therefore better adapted for general and country use than the electric car, which, however, is convenient enough in large towns, or in plying between

coachman nor groom is required for the auto-car, which can be managed by an intelligent gardener. The proprietor himself can drive the machine, for it requires no particular skill to work the handles which start and stop the engine or control the brakes.

The difference in price between the auto-car and the carriage and horses will therefore soon be made up by the saving in maintenance. To those who only require a carriage during a portion of the year, the advantages of the auto-car are obvious. At the same time, we would counsel all who are not in a hurry to wait a little before investing in an auto-car. There is no doubt whatever that in the course of the next year or two the improvements made in them will much increase their efficiency and convenience, as well as reduce their price.