

SATURDAY, JUNE 14TH, 1913.

THE AUTOCAR

A Journal published in the interests of the mechanically propelled road carriage.

EDITED BY H. WALTER STANER.

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Notes.

Tarred Roads.

Almost ever since the dry weather set in, tarring has been in progress in various parts of the country, and we must say that much of it is being done exceedingly badly. The tar is being laid on very much too thickly, and the top dressing is very sparsely used; indeed, in some cases we have actually come across long stretches which have been left overnight without any sand, granite chippings, or fine gravel spread over the tar. It would appear that either the tar men had got in front of the top dressers, or the stock of sand had given out. However that may be, the fact remains that it was impossible to pass over these stretches with-

out getting tar upon the paint work, no matter how slowly one drove. These entirely uncovered sections of tar are very exceptional, but there are now dozens if not hundreds of miles in various parts of the country which have been tarred more or less badly and only half gravelled afterwards, and, what is more, the full width of the road has been tarred simultaneously instead of half width.

It should be clearly understood that we do not infer that all tarring is bad. So far much the best is that which is done in Kent, where it is carried out in such a way as to cause the minimum of inconvenience. It will also be found, speaking broadly, that the tarring in towns is better than the tarring in the country, because the supply of the absorbent is usually much more generous. In most towns, where granite chippings are more often used than not, they are quite thickly spread and then as soon as the tar has dried a little the loose chippings are sometimes swept up and used again elsewhere, but in the country the sprinkling of granite, gravel, or sand is not swept up, and too frequently the gritting is used very parsimoniously.

Surface Tarring out of Date.

There is no doubt that a great deal of damage is being done not only to motor cars but to all well-finished horse carriages, as well as to the clothes of cyclists, by this careless tarring, and no matter how careful the individual driver over the tar may be, he is as likely as not to be spattered by some faster vehicle. What makes the matter still more galling is that surface tarring is only a palliative: it undoubtedly reduces the dust to a considerable extent for a time, but many miles of it will turn into the most dangerous grease by the autumn, grease so dangerous that it is almost impossible for horses to get a foothold or bicyclists to keep their machines up. So far as this autumn state of affairs is concerned the motorist suffers the least inconvenience of all, as the grease is usually thin enough for the tyres to penetrate and get a bite on the harder ground beneath.

The fact of the matter is that surface tar painting is out of date; the knowledge of road construction has advanced enormously since it was introduced, and it is now recognised by all the more advanced road makers as an unsatisfactory palliative, the true remedy being the waterproof road so clearly described by Col. Crompton in his recent paper before the Institution of Automobile Engineers. Nevertheless, many counties are contenting themselves by going on in the old-fashioned way of making waterbound roads and then tarring them more or less badly, and, by so doing, wasting the ratepayers' money and causing untold inconvenience to motorists and frequently danger to other forms of traffic. They had far better break up the present road surfaces and relay them with bitumen, using them as a strength crust, and then "carpet" them with a surface crust of bitumen and a suitable sand or its equivalent—a surface which could readily be renewed or patched without disturbing the strength crust at all. This sort of work is lasting, but

Notes.

the tarring in most counties is only a palliative, and all benefit from it is gone in a few months.

Of late the tarring operations have been so general that it is almost impossible for anyone not possessed of intimate local knowledge to dodge the tarred stretches, which often occur for miles on end with only a few short breaks. However, the inconvenience would be greatly reduced if the practice of tarring half the road at a time were invariable, and if sufficient sand were always used as a top dressing. We do not know which form of top dressing is best for the road, but unquestionably, so far as the inconvenience of traffic is concerned, the least inconvenience is caused by the use of sand, provided enough of it be employed; it is picked up by the tyres of vehicles far less than either granite chippings or gravel, and, so far as we have been able to ascertain by observation, is quite as efficient in other respects.

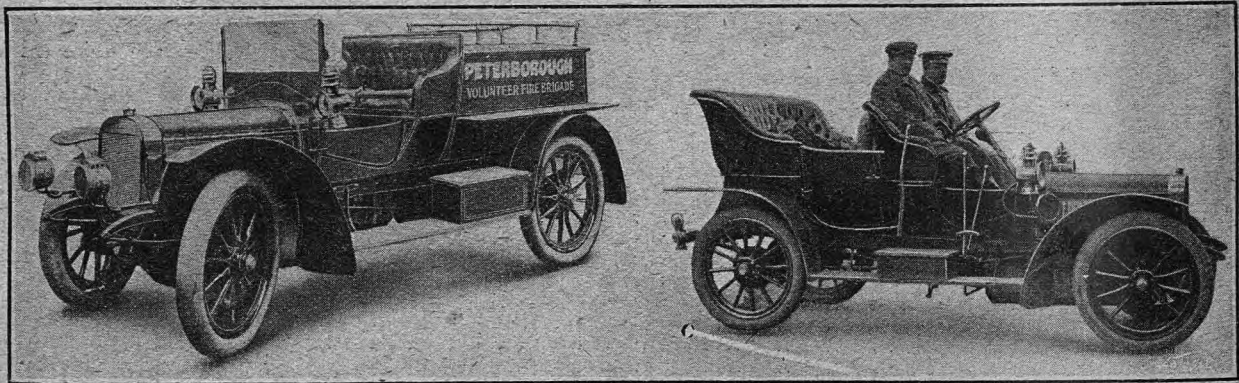
The Tyre Buyers' Guide.

The Buyers' Guide for motor cars, which we publish on the eve of each annual show at Olympia, is now well-known to our readers, and it has been suggested by more than one of them that we should compile a

winter, and there is no doubt that tyres are much more likely to give trouble in warm dry weather than in wet cool weather. Then, again, in winter time the drives are usually shorter, and many tyres which would stand quite a lot of short-distance intermittent work fail on a long run on a dry warm day. This means that the motorist with a spare wheel, and even with two spare wheels, sometimes has to purchase where and how he can, and not through his usual home agent. Again, few motorists have price lists of all makes of tyres by them, and that is another reason why we hope our compilation will be found useful.

The Question of Price.

It will be noticed on comparison that, while in many cases the prices rule almost the same for the same sizes and descriptions of tyres, there are instances in which prices are much higher in some cases than others. How far these higher prices are justified, of course, depends upon the average life of the covers supplied, but in all cases the makers charging what may be called on the higher scale claim at least proportionately longer life, and there is no doubt that in many cases these claims are justified; in fact, if they



A 16-20 h.p. Argyll which has been converted from a touring car to a tender for the Peterborough Volunteer Fire Brigade by Messrs. G. Whipple & Son, Grantham. On the right hand side of the illustration is a photograph taken of a 16-20 h.p. Argyll touring car of a similar pattern which was published in "The Autocar" in 1907.

somewhat similar table in regard to tyres. Owing to the large variety of sizes of tyres, it is impossible to give the price of every size and make of tyre on the market, but we have endeavoured to take the sixteen most widely used sizes and then to give the prices of each of these sizes classified into makes.

It seemed to us that about the present time of the year was the most suitable for the publication of such a guide, inasmuch as, speaking broadly, it may be said that at this time of the year tyres are purchased much more freely, and, for the matter of that, more frequently; than in the winter months. Not only is more driving done in the spring and summer than in the autumn and winter, but the roads run far drier even in the wettest of wet summers than they do in the

were not it is hard to see how the firms charging them could remain in business. This is a matter which each motorist must decide for himself on his individual experiences, as many maintain, and not unwisely, that, even if the higher priced tyres do not have quite proportionately extra life for the extra cost, they at least possess the unquestionable advantage of very considerably minimising tyre stops. This is quite a sound way of looking at the question, because it is obvious that, supposing the average tyre were only half the price it is, and supposing its active life were somewhat more than half as long as that of the average tyre to-day, it would still be a poor investment owing to the frequent delay and trouble which the users would suffer.

Traffic Regulation at Ascot.

With the object of reducing traffic congestion to a minimum in the immediate vicinity of the racecourse at Ascot on the four days of the meeting (June 17-20), especially during the two hours preceding the start of the first race, the R.A.C.—which as previously announced has secured control of all the garage accommodation for cars—proposes again to adopt the system of coloured lamp discs, which proved highly

satisfactory at the meeting last year. This system consists in allotting cardboard discs of certain distinctive colours to holders of tickets for the various enclosures. As the car approaches a constable or a road guide the disc is clearly visible, and those responsible for directing the traffic are enabled without loss of time to indicate to the driver the route which he should pursue.

Useful Hints and Tips.

Gear Wheels which Jump out of Mesh.

IT is very annoying to a driver to find his car gradually slowing down, with the engine speed increasing, as a consequence of a gear having jumped out of mesh. On most cars some locking mechanism is provided which involves the use of springs. Frequently there are two sliding rods which have notches at the top and spring plungers pressing down upon the notched parts. When the gear is in mesh a plunger is engaged with a notch, but if the springs become weak or the plungers stick, it is easy to see how a gear can move.

Sometimes the locking rods slide in bearings the ends of which are closed, and the grease or oil used in the gear box can find its way to the closed end of these bearings. When a gear is being engaged and the corresponding rod moved endwise, this lubricant has to be compressed, if possible. Hence pressure tending to push the gear out of engagement is caused, and unless the locking device is very good it is highly probable that it will not hold the gear in place; or it may be impossible for the driver to move the speed lever far enough to get the gear home, with the result that the locking device will not come into action.

In the writer's car these bearings are drilled at each end, so that if any lubricant finds its way in, it is pushed out and the rods can move backwards and forwards as the speed lever is moved. The consequence is that the gear box lubricant finds its way into the undershield in hot weather, whilst in cold weather the hole is not big enough to allow the lubricant to be dislodged sufficiently quickly, so that one has to do some pumping work with the speed lever to dislodge the grease when starting off.

It is quite easy to provide additional locking mechanism so as to overcome the trouble. This locking mechanism may be on or close to the gear box, or may consist of some device to hold the speed lever at the ends of the various slots of the gate quadrant. In some cases a trigger actuating a catch mounted on the lever is the best solution, but in many cases the sides of the slot in the gate quadrant may be recessed, so that the lever, when pushed to the end of the slot, can then move sideways slightly into a recess, thus preventing it from moving back into the neutral position until it is forced sideways out of the recess.

It is very important to prevent the gears jumping out of mesh, as if this happens the edges of the gears will be worn so that the teeth are bevelled off, causing the trouble to become a chronic one and the gears to be noisy. On the writer's car an indirect fourth speed was spoilt by a works tester, who, not knowing the peculiarity of the car, allowed the gear wheel to jump out of mesh two or three times. Previously it was the writer's custom to make certain that the gear was properly in mesh and a few seconds afterwards to drive the speed lever home again. The works tester evidently changed gear in the ordinary way, with the result that the gear wheels disengaged two or three times, and now a catch has been fitted to the speed lever and this must be used, for the fourth speed wheels are so badly bevelled that the gears will not stay in mesh unless the catch is holding the lever.

Often the direct drive will not stay in gear on account of wear of the fork which slides the dog

clutch. As a result of this wear the clutch is not pushed quite home, and the rounded ends of the dog clutch teeth tend to separate. If a gear be in the habit of jumping out it is well to remove the gear box lid, engage the gear, and then try by hand to move the gear out of mesh. If the gear wheel or dog clutch is free to move more than, say, a sixteenth of an inch, the trouble should be remedied. It may be due to some slackness in the gear striking rods and levers.—W.E.

Brake Adjustment for Plain and Studded Tyres.

Nowadays so many cars are used with one metal-studded tyre and one plain, grooved or other form of all-rubber tyre that it is as well to bear in mind that the old ideal of exactly equal brake adjustment for the two side brakes is no longer the right one in such cases. What we always do is to arrange the adjustment so that the brake for the plain tyred wheel is applied slightly earlier than for the studded-tyred wheel. The reason for this is that the grip of the studded tyre upon the road is so much stronger than that of the plain tyre, under the usual conditions of running, that if the brakes be equally adjusted—practically all the stress comes on the studded tyre, and the major portion of the braking work is confined to it, but by adjusting so that when the car is jacked up the plain tyred wheel is locked one notch sooner on the quadrant than the other, one can use the side brakes without the constant stressing of the studded tyre which occurs when the brakes are adjusted equally.

Obviously, this unequal adjustment cannot be arranged on brakes which are well compensated by some special fitting devised for the purpose, but many of the so-called compensated brakes are compensated only in name, and there are other brake systems in use which make no pretence at equalising the pull automatically. So far as the foot brake is concerned, when that works through the propeller-shaft nothing can be done, of course, but, as a great deal of the braking is, or should be, effected through the side brakes, it is just as well, if it can be arranged, to have the adjustment right as not.

Brake Lubrication.

Writing of side brake adjustment reminds us of a matter which it is well to look into carefully before making any brake adjustments, and that is the lubrication of all the joints of the brake from the trigger of the handle to the pins of the brake itself. The cause of brakes rubbing, and brakes which will, apparently, not come off or which go on very unequally, is not always due to adjustment defects but simply to sheer neglect of lubrication. This is not altogether the fault of the owner, as in many cases the brake pins and joints, especially those of the side brakes, are ungetatable; in any case, the back floorboards must be taken up, and very often then nothing can be done unless the car is put over a pit. As the majority of brakes have some compensating device to arrange for approximately equal distribution of the pull it seems a little inconsistent on the part of designers that this compensating arrangement should be so often placed where lubrication is a matter of the very greatest difficulty.

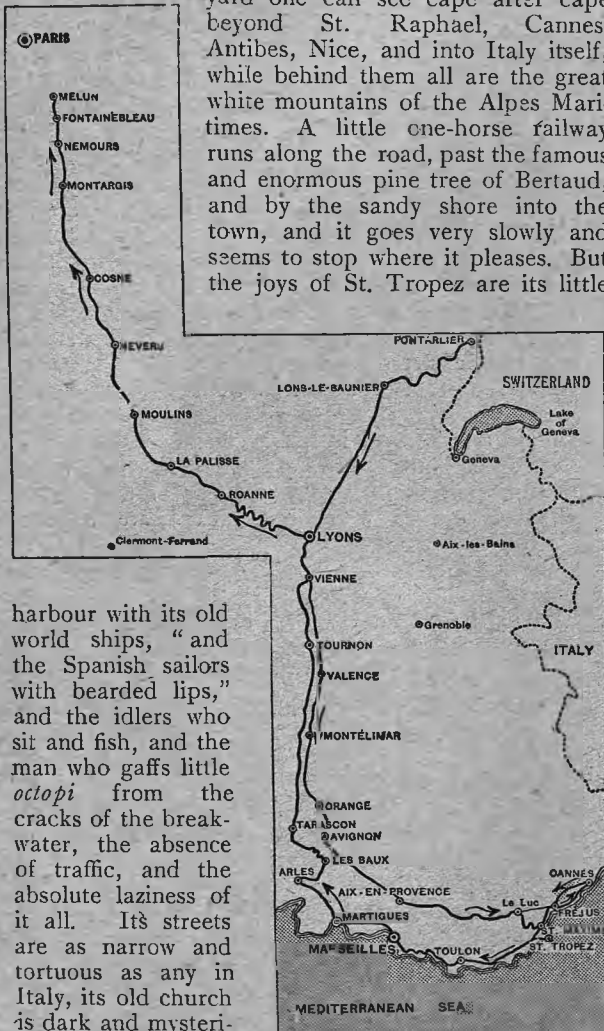
"COMPLETE HINTS AND TIPS FOR AUTOMOBILISTS." Under this title "Useful Hints and Tips" have been reprinted from *The Autocar* in booklet form. The fifth edition now on sale has been thoroughly revised and brought up to date. The book can be obtained from *The Autocar* Offices, 20, Tudor Street, London, E.C., post paid 2s. 10d.

A Spring Tour in France.

By Owen John.

(Continued from page 1024.)

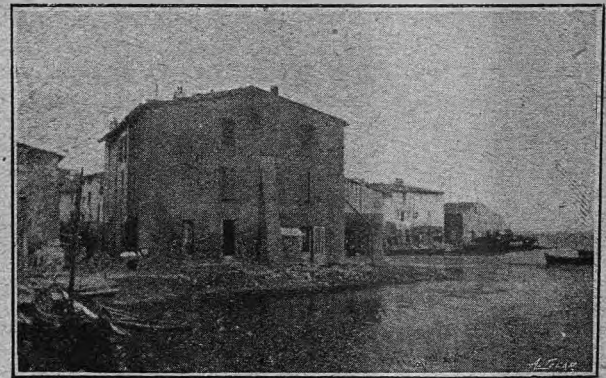
St. Tropez is a remnant, one of the few towns in original form that exist along the Riviera. Here there are no modern "flash" hotels, no imitating of Cannes, no casino, hardly any advertisements. It lies facing the mainland across a little gulf, and from the fort and watch tower above its crowded graveyard one can see cape after cape beyond St. Raphael, Cannes, Antibes, Nice, and into Italy itself, while behind them all are the great white mountains of the Alpes Maritimes. A little one-horse railway runs along the road, past the famous and enormous pine tree of Bertaud, and by the sandy shore into the town, and it goes very slowly and seems to stop where it pleases. But the joys of St. Tropez are its little



harbour with its old world ships, "and the Spanish sailors with bearded lips," and the idlers who sit and fish, and the man who gaffs little *octopi* from the cracks of the break-water, the absence of traffic, and the absolute laziness of it all. Its streets are as narrow and tortuous as any in Italy, its old church is dark and mysterious, and in it is a

wax model of St. Tropez himself, in the shape of a young Roman soldier, the only saint I have ever seen portrayed with a moustache and no beard. Beneath his bust is a glass case full of old pistols and blunderbusses, relics probably of some long-forgotten fight with England, for on the quay is a statue to some fat French admiral who was born there; and all the pictures on its base represent fearful sea battles with ships that fly our Union Jack. It was Good Friday when we left St. Tropez, and holidays were beginning. Also we had the usual difficulties in getting anything to eat except fish. But such fish! No two really alike, and not content with feeding us on *bouillabaise* we were dared to eat *aufs sang* as a beginning to our lunch. Now these things are nothing but black sea-urchins filled with crimson liquor, and a better description of them than the French name cannot be

imagined. I commend them as a new *hors d'œuvre*. They would look perfect on an old mahogany table with red candle shades and the new red and orange daffodils that have just been invented. The hostess should wear purple, and the servants should be unshaven. We stopped at the Grand Hotel *Sube et Continental*, which is a collection of old houses on the sea front, and the hostess has her own vineyards which produce wine at one franc a bottle much superior to her *vin ordinaire*. Which is but natural. One morning we rambled, over the hills and across the promontory, till we came to a place above the sea where we could sit on a carpet of hot pine needles and watch the waves beat against the red rocks at our feet. Here amid the cork trees and the pines and mimosa one might die and never be found till the cork trees needed skinning again, so wild and uninhabited seems the place. But here we had a disappointment. On the map was marked a hamlet by the salt marshes a mile to the south. There were houses, but there was no little inn; and so we had to tramp back four miles under a hot burning sun in white dust to a very late lunch indeed at St. Tropez. I commend St. Tropez to tourists who wish to get out of the ruck and to take photographs or to collect butterflies and lizards.

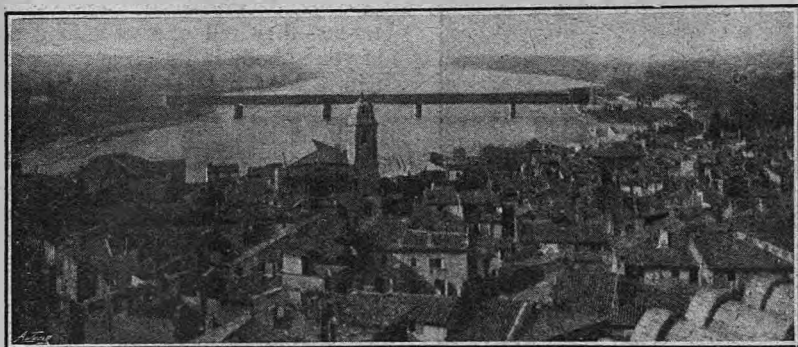


At Martigues.

The road from St. Tropez to Toulon is an inland one. There certainly is a bad twisting route part of the way by the sea as far as Bormes, but no one advises it, and though it is probably very picturesque, it is undoubtedly much more trying. But the main road by which we went is very pleasant, and lies through a wooded valley by the side of a stream, until one comes out on to the top of a hill, and it loops and twists all the way to Hyères. On our journey we stopped to admire a field of sweet-smelling narcissi, and interviewed an old lady picking wild asparagus in the hedgerows. This, later on, we tried, and certainly it is a plant which might be encouraged to grow wild at home, if it would. Hyères—in which I only stopped to buy tobacco—was very English. Golf was being played underneath an enormous hotel in a flat field with plaited hurdles as all the bunkers I could see. It seemed dull, but not so dull as the town itself, which was the sort of place one does not come all the way to France to stay at. But outside the rose gardens and flower fields were lovely. Thence

we passed along to Toulon, where we lunched. Toulon, inside the fortifications, seems charming and gay, and I should like to have lingered. West of it the road is bad and slummy, and a wrong turning showed us Tamaris and much of the French fleet in the harbour. But beyond La Seyne the road frequents the coast again, and one passes any number of neat little watering places and villages. At some of these we tried for accommodation, but because it was Easter time many of them were full up, and the others did not tempt us. So to La Ciotat, where the *Messageries Maritimes* big ships live. It is a most picturesque spot, with an extraordinary rock as a protection to it called the Bec de l'Aigle, and looking very like one. We inspected two hotels here, but they seemed so dirty—as did their proprietors—that we were not impressed. Also another policeman asked for my licence, which always upsets me. We went up and down a steep hill to Cassis, a place curiously enough neglected by the invaluable *Guide Michelin*, although it is very picturesque, and has in the summer an apparently very smart hotel. It looks like a cleft in the mountains, and is on a delightful bit of coast.

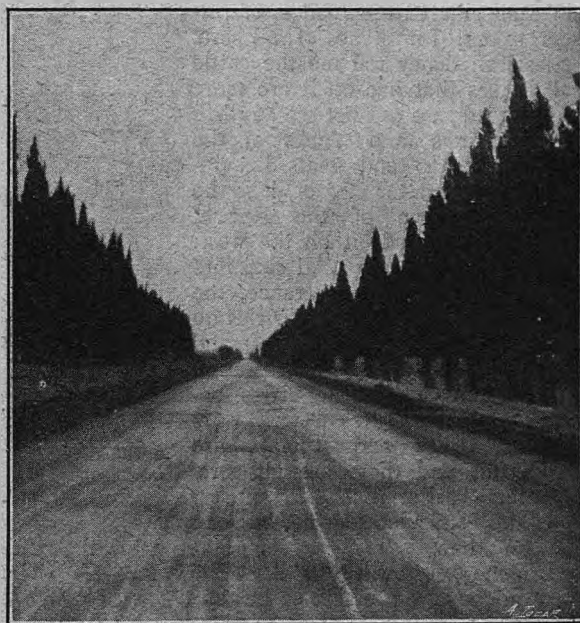
Out of Cassis climbs the coast road to Marseilles through a type of scenery quite different from any we had come across before on this trip. Very stony and barren, except for white heather and yellow gorse, lies the landscape all round, more like Scotch scenery than anything else, except an almost duplicate country I once motored through near Tarragona, in Spain. But there the scrub was *palmetto*, and the road lay nearer to the sea. Here we must have been nearly two thousand feet up in places, and the wide white road at times gave the opportunity to let the car go, although occasionally the actual rock came through the surface and made it bumpy travelling. Then, about six miles east of Marseilles, we came to the edge, and beneath us lay the Golfe du Lion, with all its busy shipping and the little islands off the great harbour. Far away one could see the flat coasts below Béziers, and in one's imagination the Pyrenees behind it. Then in great loops and curves the road dropped down into a narrow valley and civilisation in the shape of tramcars on a shocking surface, and the remaining three miles were as bad going as any I can call to mind anywhere. Indeed, the only bright spot was the purchase of petrol at 2.50 the *bidon* outside the *octroi*. After which it was a relief to get into huge Marseilles itself. We stayed at the Bristol, an excellent and by no means expensive hotel, with all the luxuries of the season. The car we sheltered at the Renault garage, and I take this opportunity of saying that charges were less than advertised.



The Rhone from the top of the Amphitheatre at Arles.

A Spring Tour in France.

Marseilles is a jolly town, and the wide Cannebière I should imagine to be the most crowded and noisy street in all the world. But it is very like the Rambla at Barcelona, or the main street in Palermo, and all the people in one are exactly like those in the others.



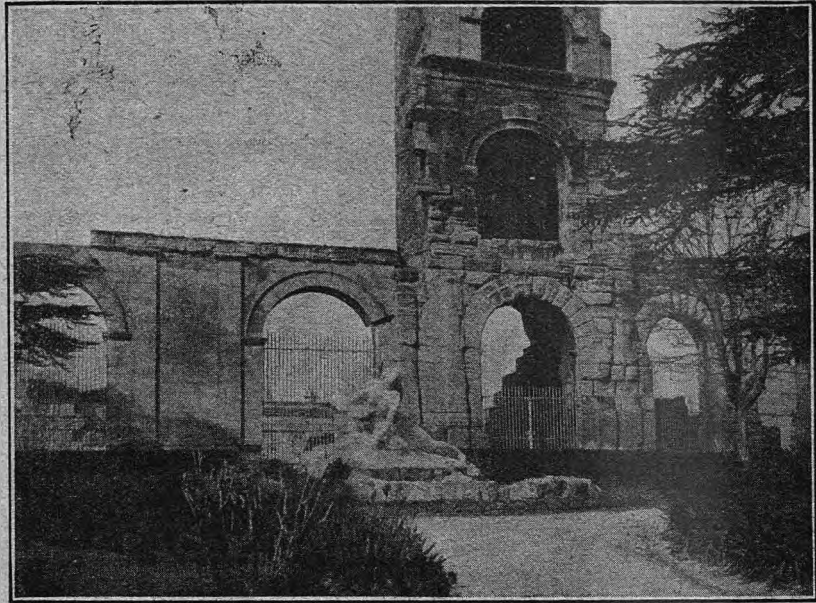
The road across La Crau.

Dwellers on the shores of the Mediterranean have no nationalities, they seem to be all of just the same type and appearance. Marseilles is a place one might linger at and enjoy excursions from. There are many things to see, including the island Monte Cristo was prisoner on—in the cinematographs—and the wonderful Notre Dame de la Garde, the sailors' church with its trouble-saving elevator and its glorious view. One could also spend happy days in the sun in the mountains we had come over.

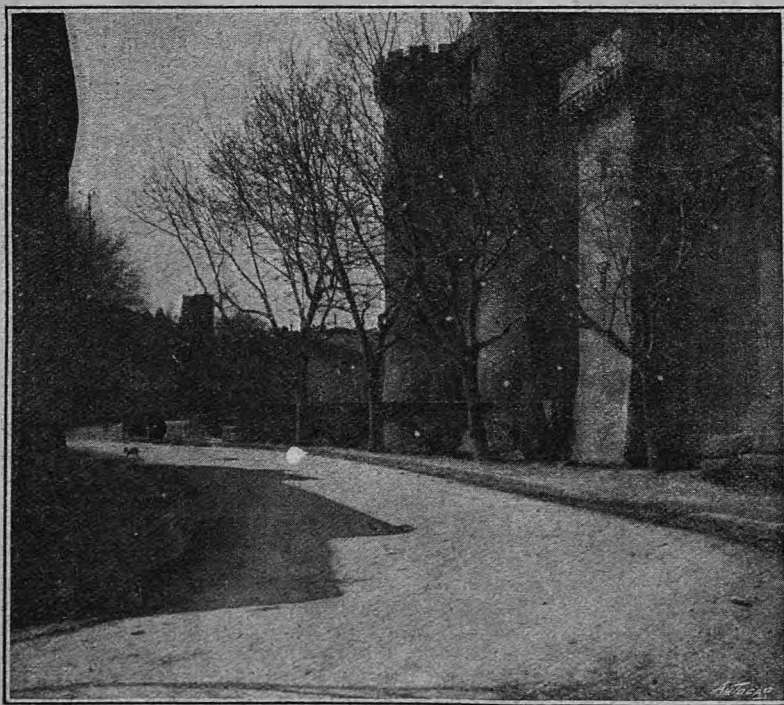
The road from Marseilles towards Paris is busy and dirty, but wide and easy to drive along. For some eight miles it is not amusing, but at about that distance we turned west for Martigues and ran along good roads and through an interesting country. Far away on our left lay the sea itself, while on our right was a very passable imitation of it in the shape of the enormous *Lac de Berre*, an inland lake almost as big as Middlesex. It was a windy day, and the white-capped waves looked huge as they made the little three-cornered boats jump and lean. All along its southern coast a stone breakwater has been built: for why I cannot tell. Martigues itself is very picturesque and the resort of many artists. Indeed, we took several photographs ourselves, and some of them seem to have come out. But it is too flat for much elegance, and there are a great many other little places which have better claims to fame. From here we made for Arles across that extraordinary country called La Crau. Perhaps for a dozen miles or so there is nothing out of the common, just the ordinary olive

A Spring Tour in France.

trees and vineyards and hedges of bamboo. Then cultivation gets poorer and the hedges go. After which cultivation gives it up as a bad job, and for leagues and leagues all is flat, stony, and unfenced. On each side of the road is emptiness except for stones of all sorts and sizes. They tell me the cattle and horses that live on it are more or less wild; we did not see any life except crows and flocks of the skinniest sheep and goats imaginable. As a matter of fact, it is the deserted bottom of the Rhone, which river bounds it on the west. But at one place our road cuts into the fastest highway in France, the thirty miles straight from Arles to Salon, and here we turned left and made along it for the much praised Arles. I have been to Arles before and admired it. Certainly its remains, Greek and Roman, are wonderful, and there are all sorts of "bits." But it is too touristy, and the small boys pester one all the time. The women here wear the little Arlesienne cap that is so becoming—of which more anon—and are said to be the best looking in all France. Certainly their features are remarkably fine as a rule, and they carry themselves well. After Arles came Mont-Majour, old abbey ruins that stand up on a little hill above the plain beside the road. Then, pointing eastwards, we came by more curious remains on a good road through a barren country, and after turning off by a road not on all maps we arrived at Les Baux, perhaps the most wonderful of all ancient towns in Europe. To arrive at Les Baux one climbs

*Roman remains at Arles.*

and twists until, at last, immediately above one against the skyline is the fortress, looking both like rocks that are castles and castles that are rocks. And what they look like they are, for this old town of Provence was once the capital of that fairest of domains, and from its battlements are to be seen most of the glories of it. Standing as a sheer rock out of the chain of the Alpilles one can spy far to the east the Alps themselves, and all the coastline along till behind Aigues Mortes—another walled town in the plains—one can almost imagine that the Eastern Pyrenees themselves are visible. But the chief attraction is the town itself with its houses hollowed out of the rocks, and its enormous ruined halls, chapels, and passages. How and when they were first built seems doubtful, there are evidences that the Romans were there at one time, and it is unlikely that its advantages escaped the notice of fighting men long before them. We were not lucky in our weather at Les Baux, but low clouds and whiffs of fog perhaps suit its frowning glories better than sunshine. Many tourists visit it from Arles and Salon, but few stop there as we did. The Hotel de la Reine Jeanne—they tell of the finding of her young body in its grave wrapped in its golden tresses and she is the local deity—is very good. Indeed, it will be better by the time these words are in print, for a new landlord and his wife, both English-speaking, have taken it over, and are doing wonders with its old and rambling inside. It will be no fault of theirs if Les Baux does not "boom"—if the word may be pardoned—and I know of no place which is more worthy of special attention.

*Old castles at Tarascon.*

We were in luck here. Staying in the hotel was the famous artist Paul Sarrut, and since we three were the only guests and he talks English like a native, we spent the pleasantest of Easter eves. Indeed, it was more in the nature of a family party, for after dinner—which included our old friend wild asparagus—we all adjourned to the kitchen, and assisted in making the local Easter delicacy, which is a cross between Yorkshire pudding and a pancake. I was poor at it, but M. Sarrut became an expert. The local *curé* joined us, and we learned a great many things we did not know before. Then to bed, looking forward to seeing Les Baux in its Easter finery on the morrow.

“And, oh! she dances
in a way
No sun upon an
Easter day
Is ever half so fine
a sight!”

Thus the old song, and Les Baux should have been the right setting for it. But, as a matter of fact, it rained and kept on raining. Therefore the beautiful inhabitants all went to Mass under umbrellas, though most of them wore their dainty caps as their great-grandmothers used to. It was much too gloomy to photograph anything, and I was just bewailing my luck when it changed. M. Sarrut came along and

dried my tears by presenting me with exactly what I wanted, a picture of the beauty of Les Baux drawn by him, all unawares, as she sat by the great stone pillars in the old church at the great Easter service. I was, indeed, fortunate, for Paul Sarrut is a noted artist in more than one country.

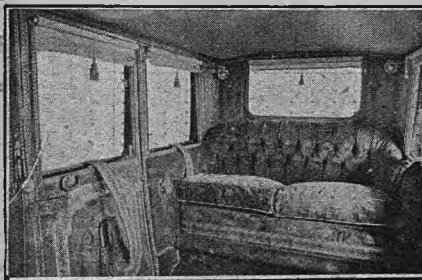
About ten o'clock tourists began to arrive *en auto*. Their costumes were immense from gaiters to cap, and their womenfolk were *en suite*. Also arrived M. Echenard, of the Grand Hotel de Louvre and Paix at Marseilles, and late of the Ritz and Carlton, Paris and London. He came in a beautiful eight-cylinder De Dion, and he is the power behind the throne at the Hotel de la Reine Jeanne. That hotel is going to do well, and so is Les Baux, but I hope too much prosperity is not going to spoil its native charm. We left after lunch on Sunday, and climbed through the Val d'Enfer—or some gorge like it—in a mist that made us think of the top of the Pass of Glencoe.

Then down again into the Rhone Valley, and so to Tarascon, where the old castles frown at each other, though no longer in a belligerent spirit, across the wide waters.

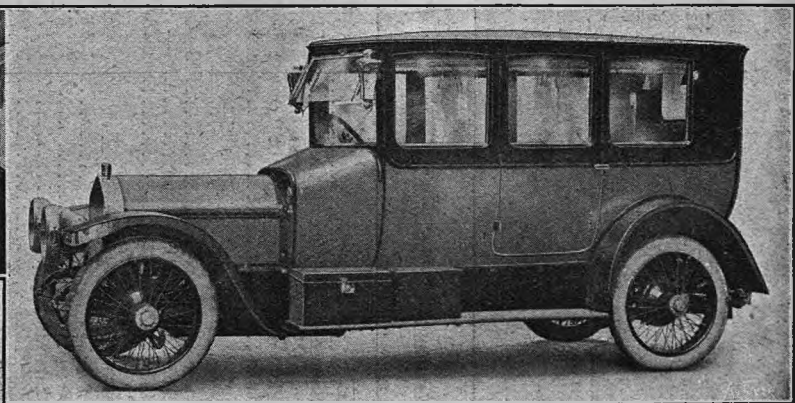
(To be concluded.)



An Arlesienne. Reproduced from a crayon drawing by Paul Sarrut.



A short wheelbase 16-20 h.p. Wolseley fitted with a handsome saloon body, built by Messrs. J. Blake and Co., Rodney Street, Liverpool, for Mr. H. A. Radforth, of that city. A C.A.V. electric lighting set is used with a special form of side lamps. The interior lighting is by means of a centre light and four corner lamps. The upholstery is in blue silk, the general colour scheme being blue with the top exterior panels black. The interior is shown in the smaller view.



THE TYRE BUYERS' GUIDE.

The present prices of the different pattern covers and tubes marketed by the principal manufacturers arranged for ease of comparison

The sixteen most widely used sizes are included, also the three principal American sizes, and two at the small end of the scale that are often adopted by makers of miniature cars.

In the following tables prices are given to the nearest shilling:

Make and Description of Tyre.	650	750	700	750	800	760	810	810	765	815	875	915	820	880	920	1020	895	935	American Sizes.			
	× 65	× 65	× 85	× 85	× 85	× 90	× 90	× 100	× 105	× 105	× 105	× 105	× 120	× 120	× 120	× 120	× 135	× 135	30"× 3"	30"× 3½"	32"× 3½"	
AVON—	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.
Steel studded	2 19	3 9	3 8	3 15	4 0	4 11	4 17	6 10	6 3	6 12	7 1	7 9	7 6	7 19	8 6	9 7	9 4	9 15	4 1	5 1	5 7	
(a) Square or round tread	1 11	1 16	2 2	2 6	2 9	3 8	3 10	4 18	4 12	4 19	5 6	5 13	5 18	6 8	6 14	7 11	7 5	7 13	2 3	3 13	3 19	
"Special" extra thick grooved tread	1 19	—	2 14	2 17	—	3 19	4 2	5 12	5 5	5 13	6 3	—	6 15	7 7	7 14	—	—	—	2 11	4 4	4 11	
(b) Plain round tread for "light" cars	1 10	1 14	1 19	2 2	2 5	2 19	3 5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Air tube	12	14	17	18	19	1 2	1 4	1 7	1 7	1 8	1 10	1 12	1 13	1 16	1 18	2 4	2 0	2 3	18	1 2	1 4	
BELDAM—																						
All rubber, non-skid	3 0	—	3 19	—	—	5 17	6 11	7 14	—	8 9	9 0	—	10 4	10 14	11 0	—	13 1	13 18	—	—	—	
Rubber-steel, non-skid	—	—	—	—	—	7 5	7 10	8 2	—	9 0	10 5	—	11 8	12 4	12 18	—	15 4	15 18	—	—	—	
Air tube	13	—	17	—	—	1 3	1 4	1 8	—	1 9	1 11	—	1 14	1 17	1 19	—	2 2	2 5	—	—	—	
CLINCHER (NORTH BRITISH)—																						
Plain ribbed	1 11	—	2 2	—	—	3 8	3 10	4 18	4 12	4 19	5 6	5 13	5 18	6 8	6 14	—	7 5	7 13	2 3	3 13	3 19	
Grooved	2 2	—	2 17	—	—	4 3	4 5	5 17	5 10	5 18	6 7	6 14	7 1	7 13	8 0	—	8 13	9 3	2 14	4 8	4 15	
Rubber studded	1 17	—	2 10	—	—	3 15	3 18	5 8	5 1	5 19	5 17	6 3	6 9	7 0	7 7	—	7 19	8 8	—	—	—	
Steel studded	3 0	—	3 6	—	—	4 11	4 17	6 10	6 3	6 11	7 1	7 9	7 6	7 19	8 6	—	9 4	9 15	4 1	5 1	5 7	
Air tube	12	—	17	—	—	1 2	1 4	1 7	1 7	1 8	1 10	1 12	1 13	1 16	1 18	—	2 0	2 3	18	1 2	1 4	
COLLIER—																						
Square tread	—	—	2 5	2 8	—	3 1	3 4	4 8	4 2	4 9	4 17	5 2	5 7	5 16	6 3	—	6 13	6 19	1 18	—	3 10	
Grooved limousine	—	—	2 11	2 16	—	3 15	3 17	5 6	5 0	5 7	5 16	6 2	6 9	6 19	7 6	—	7 18	8 7	2 8	—	4 4	
Steel-studded limousine	—	—	3 7	3 14	—	4 2	4 9	5 18	5 11	6 0	6 9	6 15	6 14	7 6	7 11	—	8 8	8 18	3 12	—	4 14	
Air tube	—	—	16	17	—	1 0	1 2	1 6	1 5	1 7	1 9	1 10	1 11	1 13	1 15	—	1 18	2 1	14	—	1 1	
*CONTINENTAL—																						
Flat tread	—	—	—	—	—	3 10	3 12	5 1	4 14	5 2	5 9	5 16	6 1	6 11	6 18	7 15	7 9	7 17	2 5	3 15	4 2	
Three-ribbed, leather or rubber-studded	—	—	—	—	—	4 13	5 0	6 14	6 6	6 15	7 5	7 13	7 10	8 4	8 11	9 12	9 9	10 1	—	5 6	5 17	
Light car, plain tread, reinforced	1 15	2 1	2 0	2 4	2 6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
" " " " extra fort	1 18	2 4	2 4	2 7	2 11	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
" " " " steel studded, non-skids	3 1	3 10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Air tube	13	16	17	18	1 0	18	1 0	1 8	1 8	1 9	1 11	1 13	1 14	1 17	1 19	2 5	2 2	2 5	18	1 3	1 5	

(a) Two different pattern rubber tyres, price of either pattern is the same; as an extra non-skidding device transverse grooves can be put in the tread for an additional 7s. 6d. per cover. (b) In addition to these "light car" tyres, Avon special cycle car tyres are also made. * Continental tyres are also manufactured in the following oversizes:—Flat tread, to fit 105 mm. rim 815 × 125. £7 1s. 875 × 125. £7 15s. to fit 120 mm. rim 820 × 135. £7 7s. 880 × 135. £7 17s. 920 × 135. £8 5s. Ribbed, leather or rubber studded " " " " " " £9 0s. " " " " " " £9 18s. " " " " " " £9 6s. " " " " " " £9 18s. " " " " " " £10 10s. Air tube " " " " " " £1 19s. " " " " " " £2 2s. " " " " " " £2 1s. " " " " " " £2 4s. " " " " " " £2 7s.

The Tyre Buyers' Guide.

Make and Description of Tyre.	650	750	700	750	800	760	810	810	765	815	875	915	820	890	920	1020	895	935	American Sizes.			
	× 65	× 65	× 85	× 85	× 85	× 90	× 90	× 100	× 105	× 105	× 105	× 105	× 120	× 120	× 120	× 120	× 135	× 135	30"× 3"	30"× 3½"	32"× 3½"	
	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.
DUNLOP—																						
Plain	1 12	1 17	2 4	2 7	2 11	3 10	3 12	5 1	4 14	5 2	5 9	5 16	6 1	6 11	6 18	7 15	7 9	7 17	2 5	3 15	4 2	
Grooved	2 3	2 8	2 19	3 3	3 6	4 5	4 8	6 0	5 13	6 1	6 10	6 18	7 5	7 17	8 5	9 7	8 18	9 8	2 16	4 10	4 18	
Steel studded	3 1	—	—	3 15	4 0	4 13	5 0	6 14	6 6	6 15	7 5	7 13	7 10	8 4	8 11	9 12	9 9	10 1	4 3	5 4	5 10	
Plain limousine	—	—	—	—	—	—	—	—	—	—	—	—	7 0	7 10	7 16	—	8 8	8 16	—	—	—	
Grooved limousine	—	—	—	—	—	—	—	—	—	—	—	—	8 3	8 15	9 3	—	9 16	10 6	—	—	—	
Steel-studded limousine	—	—	—	—	—	—	—	—	—	—	—	—	8 8	9 2	9 9	—	10 8	10 19	—	—	—	
Plain, for light cars	1 11	1 15	2 0	2 4	2 6	3 6	3 7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
(c) Air tube	13	15	17	18	1 0	1 3	1 4	1 8	1 8	1 9	1 11	1 13	1 14	1 17	1 19	2 5	2 2	2 5	18	1 3	1 5	
GAMAGE—																						
Grooved	—	—	2 15	—	—	4 0	4 4	—	—	5 15	6 4	—	6 17	7 9	—	—	—	—	—	—	—	
Ribbed	—	—	1 18	—	—	3 1	3 3	—	—	4 9	4 16	—	5 6	5 15	6 1	—	8 10	9 1	2 0	3 6	—	
Steel studded	—	—	—	—	—	4 2	4 8	—	—	5 19	6 7	—	6 11	7 3	7 10	—	8 6	8 17	3 13	4 11	—	
Air tube	—	—	15	—	—	1 1	1 1	—	—	1 6	1 7	—	1 10	1 12	1 14	—	1 16	1 19	16	1 1	—	
GAULOIS—																						
Square grey tread	1 14	2 2	2 7	2 11	2 14	3 8	3 10	4 18	4 12	4 19	5 6	5 13	5 18	6 8	6 14	7 11	7 5	7 13	2 3	3 13	3 19	
Square white tread	2 3	2 9	2 17	3 1	3 5	4 2	4 5	5 17	5 10	5 18	6 7	6 14	7 1	7 13	8 0	9 2	8 13	9 3	2 17	4 5	4 12	
Steel studded	2 19	3 9	—	—	—	4 11	4 17	6 11	6 3	6 12	7 1	7 9	7 6	7 19	8 7	9 7	9 5	9 15	4 1	5 1	5 7	
Air tube	13	14	17	17	18	18	19	1 7	1 7	1 8	1 10	1 12	1 13	1 16	1 18	2 4	2 0	2 3	18	1 2	1 4	
*GOODRICH—																						
Round tread	—	—	2 4	2 7	2 11	3 10	3 12	5 1	4 14	5 2	5 9	5 16	6 1	6 11	6 18	—	7 9	7 17	2 16	4 2	4 8	
Rubber studded	2 5	—	2 19	3 3	3 6	4 5	4 8	6 0	5 13	6 1	6 10	6 18	7 5	7 17	8 5	—	8 18	9 8	3 1	4 9	4 15	
Steel studded	—	—	—	—	—	4 13	5 0	6 14	6 6	6 15	7 5	7 13	7 10	8 4	8 11	—	9 9	10 1	—	5 2	5 10	
Air tube	13	—	17	18	1 0	1 3	1 4	1 8	1 8	1 9	1 11	1 13	1 14	1 17	1 19	—	2 2	2 5	18	1 2	1 4	
†GRIMSTON—																						
Grooved	—	—	—	—	—	4 1	4 4	—	5 10	5 17	6 5	6 11	6 19	7 11	7 18	—	8 11	9 1	2 14	4 8	—	
Steel studded non-skid	—	—	—	—	—	4 11	4 17	—	6 2	6 12	7 1	7 9	7 6	7 19	8 7	—	9 5	9 15	4 1	5 1	—	
Air tube	—	—	—	—	—	1 2	1 4	—	1 7	1 8	1 10	1 12	1 13	1 16	1 18	—	2 0	2 3	18	1 2	—	
HELSEBY—																						
Cover	—	—	4 18	—	—	5 12	5 18	6 15	—	7 15	8 6	—	9 0	9 10	9 16	—	11 11	12 12	—	—	—	
Air tube	—	—	1 0	—	—	1 5	1 7	1 10	—	1 12	1 14	—	1 17	2 0	2 2	—	2 5	2 8	—	—	—	
HERMETIC—																						
Plain	1 12	—	2 4	2 7	2 11	3 10	3 12	5 1	—	5 2	5 9	—	6 1	6 11	6 18	—	7 9	7 17	—	—	—	
Grooved	1 18	—	2 10	2 13	2 17	3 16	3 18	5 7	—	5 8	5 16	—	6 9	6 19	7 5	—	7 17	8 5	—	—	—	
Flat grooved	2 1	—	2 13	2 16	3 0	3 19	4 1	5 10	—	5 13	6 0	—	6 12	7 2	7 9	—	—	—	—	—	—	
Steel studded	3 1	—	3 8	3 15	4 0	4 13	5 0	6 14	—	6 15	7 5	—	7 10	8 4	8 11	—	9 9	10 1	—	—	—	
(d) Air tube	13	—	17	18	1 0	1 3	1 4	1 8	—	1 9	1 11	—	1 14	1 17	1 19	—	2 2	2 5	—	—	—	
KEMPSHALL—																						
Grooved	—	—	—	—	—	4 8	4 9	5 12	5 10	5 18	6 6	6 13	7 0	7 11	7 19	—	9 0	9 16	3 0	4 8	4 15	
All rubber "non-skid"	4 4	4 13	5 13	5 15	—	5 19	6 0	7 16	7 3	7 19	9 10	10 10	10 19	11 13	12 0	—	14 3	14 19	—	5 18	—	
All rubber "anti-skid"	3 3	3 14	4 0	4 5	—	5 5	5 10	6 8	6 13	7 2	7 5	7 15	8 3	8 12	8 18	—	—	—	4 0	5 10	6 0	
Combined-steel and rubber studded	—	—	—	—	—	5 3	5 8	6 14	—	7 5	7 15	8 5	8 8	8 18	9 5	—	—	—	—	—	—	
Moulded rubber anti-skid	—	—	—	—	—	3 15	3 19	—	—	5 3	—	6 6	—	6 18	—	—	—	—	—	—	—	
Air tube	14	16	18	19	—	1 5	1 7	1 11	1 10	1 12	1 14	1 16	1 17	2 0	2 2	—	2 5	2 8	1 0	1 2	1 4	

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(c) Dunlop light tubes are also made in the following sizes: 700×90, 760×90, and 810×90; the prices are slightly less than those of the ordinary tubes; the Dunlop "limousine" tubes are the same prices as the ordinary tubes. (d) There is also a lighter pattern Hermetic tube in all these sizes at slightly less cost. † Round tread. * The Goodrich Co., manufacture more sizes in American types than they do in those given, and the range of types includes: "Regular Bead," "Quick Detachable Bead," and "Q.D. Straight Bead." ‡ Retail cash with order prices are quoted, 10% discount being allowed off list prices.

Make and Description of Tyre.	650	750	700	750	800	760	810	810	765	815	875	915	820	880	920	1020	895	935	American Sizes.			
	× 65	× 65	× 85	× 85	× 85	× 90	× 90	× 100	× 105	× 105	× 105	× 105	× 120	× 120	× 120	× 120	× 135	× 135	30"× 3"	30"× 3½"	32"× 3½"	
	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.
LIVERSIDGE—																						
Plain	1 15	—	—	—	—	3 14	3 17	5 8	—	5 9	5 17	6 4	6 10	7 1	7 8	—	8 0	8 9	—	—	—	—
(e) Steel and rubber non-skids	4 3	—	—	—	—	6 2	6 13	7 16	—	8 15	9 7	9 16	9 19	10 15	11 4	—	12 12	13 10	—	—	—	—
Air tube	15	—	—	—	—	1 4	1 6	1 11	—	1 11	1 13	1 18	1 18	2 0	2 3	—	2 5	2 8	—	—	—	—
LOMAX—																						
Square tread	1 11	—	2 2	2 6	—	3 8	3 10	4 18	4 12	4 19	5 6	—	5 18	6 8	6 14	—	7 5	7 13	2 3	3 13	3 19	—
(f) Grooved or three-ribbed	2 2	—	2 17	3 1	—	4 3	4 5	5 17	5 10	5 18	6 7	—	7 1	7 13	8 0	—	8 13	9 3	2 14	4 8	4 15	—
Steel studded	—	—	—	—	—	4 11	4 17	6 10	6 3	6 11	7 1	—	7 6	7 19	8 6	—	9 4	9 15	—	5 1	5 7	—
Air tube	10	—	16	17	—	1 1	1 2	1 5	—	1 7	1 10	—	—	1 16	1 18	—	—	—	—	—	—	—
MACINTOSH—																						
Plain	1 12	1 17	2 4	2 7	2 11	3 10	3 12	5 1	4 14	5 2	5 9	5 16	6 1	6 11	6 18	—	7 9	7 17	2 3	3 13	3 19	—
(g) Grooved or three-ribbed	2 3	2 8	2 19	3 3	3 6	4 3	4 5	5 17	5 10	5 18	6 7	6 14	7 1	7 13	8 0	—	8 13	9 3	2 16	4 5	4 11	—
Fibre and steel studded non-skid	3 0	3 9	3 13	3 15	4 0	4 11	4 17	6 10	6 3	6 11	7 1	7 9	7 6	7 19	8 6	—	9 4	9 15	4 1	5 1	5 7	—
Air tube	12	14	17	18	19	1 2	1 4	1 7	1 7	1 8	1 10	1 12	1 13	1 16	1 18	—	2 0	2 3	18	1 3	1 5	—
MICHELIN—																						
Square tread	—	—	—	—	—	3 8	3 10	—	4 12	4 19	5 6	5 13	5 18	6 8	6 14	7 11	7 5	7 13	2 3	3 13	3 19	—
"Semelle" steel studded	—	—	—	—	—	4 11	4 17	—	6 3	6 12	7 1	7 9	7 6	7 19	8 7	9 7	9 5	9 15	4 1	5 1	5 7	—
(h) Square tread for light cars	1 17	2 2	1 19	2 2	2 5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
"Semelle" steel studded for light cars	3 0	3 9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Air tube	13	15	17	18	1 0	18	1 0	—	1 7	1 9	1 11	1 13	1 14	1 17	1 18	2 5	2 1	2 4	18	1 2	1 4	—
MIDLAND—																						
"Britannic" square or plain tread ..	—	—	1 16	2 1	—	2 19	3 1	4 5	—	4 7	4 13	—	5 3	5 12	5 17	6 12	6 7	6 14	2 2	3 10	3 15	—
Grooved	—	—	2 9	2 12	—	3 11	3 13	5 1	—	5 2	5 9	—	6 0	6 10	6 16	7 15	7 8	7 16	2 12	4 5	4 10	—
Steel studded	—	—	—	—	—	3 18	4 3	5 12	—	5 12	6 10	—	6 5	6 16	7 2	8 0	7 18	8 7	4 0	4 17	5 0	—
Air tube	—	—	14	15	—	19	19	1 1	—	1 5	1 7	—	1 10	1 13	1 15	1 18	1 18	1 19	16	1 0	1 2	—
MOSELEY—																						
Ribbed	—	—	2 10	—	—	2 18	3 1	3 10	—	4 8	4 15	—	5 4	5 15	6 3	—	6 15	—	2 5	3 10	4 3	—
Steel studded	—	—	3 7	—	—	3 17	4 2	4 14	—	5 17	6 7	—	6 10	7 4	7 13	—	8 9	—	—	—	—	—
Air tube	12	13	15	16	—	19	1 0	1 2	1 4	1 6	1 7	1 10	1 12	1 13	1 15	—	1 19	2 1	15	19	1 2	—
PALMER CORD—																						
Ribbed	—	—	—	—	—	5 3	6 0	—	7 4	8 1	8 11	9 1	11 0	11 15	12 4	—	14 4	15 0	—	†5 3	—	—
Steel studded	—	—	—	—	—	6 7	6 17	—	8 7	9 4	9 18	10 9	12 10	13 10	14 2	—	16 1	16 18	—	—	—	—
Air tube	—	—	—	—	—	1 7	1 9	—	1 12	1 14	1 16	1 19	2 0	2 3	2 5	—	2 9	2 12	—	1 7	—	—
PETER UNION—																						
Round tread	1 12	1 17	2 4	2 7	2 11	3 10	3 12	5 1	4 14	5 2	5 9	5 16	6 1	6 11	6 18	—	7 9	7 17	2 3	3 13	3 19	—
Square tread, reinforced	—	—	2 19	3 5	—	4 5	4 8	6 2	5 14	6 3	6 11	6 18	7 5	7 17	8 5	—	8 18	9 9	—	—	—	—
Three-ribbed	—	—	—	—	—	4 13	—	6 14	—	6 15	7 5	—	7 10	8 4	8 11	—	9 9	10 1	—	—	—	—
Steel studded	3 1	3 10	3 18	4 0	4 5	4 13	5 0	6 14	6 6	6 15	7 5	7 13	7 10	8 4	8 11	—	9 9	10 1	—	5 1	5 7	—
Steel-studded limousine	—	—	—	—	—	—	—	—	7 6	7 18	8 10	9 5	8 16	9 12	10 1	—	11 2	11 15	—	—	—	—
Air tube	13	15	17	18	1 0	1 3	1 4	1 8	1 8	1 9	1 11	1 13	1 14	1 17	1 19	—	2 2	2 5	18	1 2	1 4	—

(e) The Liversidge steel and rubber non-skid is made in two patterns—one with a "stud" thread, and the other with a "ridge" thread; the prices are the same. (f) Prices of Lomax grooved and three-ribbed covers are the same. (g) Prices of Macintosh grooved and three-ribbed covers are the same. (h) In addition to the 700×85, 750×85, and 800×85 light car covers here quoted, "extra strong" Michelin covers in these three sizes are supplied at slightly extra charges. † Rubber studded.

The Tyre Buyers' Guide.

Make and Description of Tyre.	American Sizes.																					
	650 × 65	750 × 65	700 × 85	750 × 85	800 × 85	760 × 90	810 × 90	810 × 100	765 × 105	815 × 105	875 × 105	915 × 105	820 × 120	880 × 120	920 × 120	1020 × 120	895 × 135	935 × 135	30"× 3"	30"× 3½"	32"× 3½"	
PIRELLI—	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.
Round tread	2 0	2 5	3 0	3 7	4 0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Square tread	—	—	—	—	—	3 15	3 18	5 6	5 2	5 10	5 18	6 5	6 11	7 2	7 9	8 8	8 1	8 10	—	4 10	5 0	—
Steel studded	3 5	3 18	—	—	—	5 1	5 8	7 0	6 16	7 6	7 17	8 5	8 2	8 17	9 5	10 8	10 5	10 17	—	—	—	—
Air tube	14	15	1 0	1 1	1 4	1 5	1 7	1 11	1 10	1 12	1 14	1 16	1 17	2 0	2 2	2 9	—	—	1 0	1 5	1 7	—
PROWODNIK—																						
"Columb" rubber non-skid	2 13	3 3	3 8	3 13	—	4 11	4 17	6 11	—	6 12	7 1	7 9	7 8	7 19	8 7	—	9 8	9 19	4 1	5 1	5 7	—
Steel studded	—	—	—	—	—	4 16	5 2	6 17	—	6 18	7 9	7 16	7 16	8 7	8 15	—	9 18	10 9	4 5	5 6	5 13	—
Air tube	12	13	18	19	—	1 3	1 5	1 9	—	1 10	1 12	1 14	1 15	1 18	2 0	—	2 3	2 5	19	1 3	1 5	—
HARRODS SHELL—																						
Grooved	—	—	2 15	2 17	2 19	3 9	3 16	4 8	—	5 5	5 7	—	6 4	6 13	7 3	—	7 19	8 6	—	—	—	—
Steel-studded	—	—	—	—	—	4 2	4 8	—	—	5 19	6 7	—	6 11	7 3	7 15	—	8 15	9 5	3 13	4 11	—	—
Air tube	—	—	15	16	19	1 0	1 1	1 5	—	1 6	1 7	—	1 10	1 12	1 14	—	1 16	1 19	16	1 0	—	—
SIRDAR—																						
Plain	1 11	1 16	2 2	2 6	—	3 8	3 10	4 18	—	4 19	5 6	5 13	5 18	6 8	6 14	—	7 5	7 13	—	—	—	—
Grooved	2 2	2 7	2 17	3 1	—	4 3	4 5	5 17	—	5 18	6 7	6 14	7 1	7 13	8 0	—	8 13	9 3	—	—	—	—
Steel studded	2 19	3 9	3 15	3 16	—	4 11	4 17	6 10	—	6 11	7 1	7 9	7 6	7 19	8 6	—	9 4	9 15	—	—	—	—
Air tube	12	14	17	18	—	1 2	1 4	1 7	—	1 8	1 10	1 12	1 13	1 16	1 18	—	2 0	2 3	—	—	—	—
*SKEW—																						
Flat tread	—	—	2 10	2 15	—	3 15	3 18	5 8	—	5 10	5 18	6 5	6 10	7 3	7 10	—	8 3	8 13	2 18	4 0	—	—
Round rubber anti-skid	—	—	3 8	3 12	—	4 18	5 9	5 19	—	7 5	7 13	8 2	8 12	9 6	9 11	—	10 13	11 5	3 12	4 18	—	—
Square rubber non-skid	—	—	4 5	4 10	—	5 3	5 18	7 3	—	8 0	8 10	9 11	9 18	10 8	11 3	—	12 18	13 18	4 18	5 14	—	—
Steel studded	—	—	4 0	4 5	—	5 0	5 8	7 0	—	7 5	7 18	8 5	8 3	8 18	9 5	—	10 5	10 18	4 8	5 7	—	—
Air tube	—	—	1 1	1 2	—	1 6	1 6	1 12	—	1 13	1 15	1 18	1 18	2 2	2 4	—	2 6	2 10	1 2	1 6	—	—
SPENCER-MOULTON—																						
Plain	—	—	—	—	—	3 8	3 10	4 18	4 12	4 19	5 6	5 13	5 18	6 8	6 14	—	7 5	7 13	2 3	3 13	3 19	—
Grooved	—	—	—	—	—	4 3	4 5	5 17	5 10	5 18	6 7	6 14	7 1	7 13	8 0	—	8 13	9 3	2 14	4 8	4 15	—
Th eo-ribbed	—	—	—	—	—	4 7	4 13	6 4	5 16	6 5	6 14	7 2	7 3	7 16	8 3	—	†8 19	†9 9	3 1	4 14	5 1	—
Steel studded	—	—	—	—	—	4 11	4 17	6 11	6 3	6 12	7 1	7 9	7 6	7 19	8 7	—	†9 5	†9 15	4 1	5 1	5 7	—
Air tube	—	—	—	—	—	1 2	1 4	1 7	1 7	1 8	1 10	1 12	1 13	1 16	1 18	—	2 0	2 3	18	1 2	1 4	—
STELASTIC—																						
Plain (non-skid)	—	—	—	—	—	5 4	5 8	7 7	6 18	7 9	8 0	8 9	8 17	9 13	10 2	—	10 18	11 10	3 12	5 5	5 15	—
Air tube	—	—	—	—	—	1 4	1 6	1 10	1 10	1 11	1 13	1 15	1 13	2 0	2 1	—	2 5	2 8	1 0	1 5	1 7	—
STEPNEY—																						
Square tread	1 12	1 17	2 4	2 7	2 11	3 10	3 12	5 1	—	5 2	5 9	5 16	6 1	6 11	6 18	—	7 9	7 17	—	3 15	4 2	—
Grooved	2 3	2 8	2 19	3 3	3 6	4 5	4 8	6 0	—	6 1	6 10	6 18	7 5	7 17	8 5	—	8 18	9 8	—	4 10	4 18	—
Road-Grip	—	—	3 13	3 15	—	4 13	5 0	6 14	—	6 15	7 5	—	7 10	8 4	8 11	—	9 9	10 1	—	5 4	—	—
Steel studded	—	—	—	—	—	4 13	5 0	6 14	—	6 15	7 5	7 13	7 10	8 4	8 11	—	9 9	10 1	4 3	5 4	5 10	—
Air tube	13	15	17	18	1 0	1 3	1 4	1 8	—	1 9	1 11	1 13	1 14	1 17	1 19	—	2 2	2 5	18	1 3	1 5	—
†VICTOR—																						
Round or square	—	—	2 9	2 13	—	3 14	3 17	5 8	5 0	5 9	5 17	6 4	6 10	7 0	7 7	—	8 0	8 8	2 8	4 0	4 7	—
Grooved limousine	—	—	3 12	3 17	—	4 11	4 14	6 9	6 4	6 10	7 0	7 8	7 15	8 8	8 16	—	9 11	10 1	3 0	4 17	5 1	—
Steel studded	—	—	4 2	4 6	—	5 0	5 7	7 3	6 16	7 5	7 15	8 3	8 0	8 15	9 3	—	10 3	10 15	4 9	5 11	5 18	—
Air tube	—	—	18	19	—	1 4	1 6	1 10	1 11	1 11	1 13	1 15	1 16	1 19	2 1	—	2 4	2 7	19	1 4	1 6	—
WOOD MILNE—																						
"Griprib" or grooved	2 2	—	2 17	3 1	—	4 3	4 5	5 17	5 10	5 18	6 7	6 14	7 1	7 13	8 0	—	8 13	9 3	3 2	4 8	4 15	—
Steel studded	2 19	—	—	—	—	5 1	5 8	7 0	6 13	7 0	7 12	8 5	8 0	8 10	9 0	—	10 5	10 17	4 1	5 1	5 7	—
Air tube	13	—	17	18	—	1 3	1 4	1 8	1 8	1 9	1 11	1 13	1 14	1 17	1 19	—	2 2	2 5	18	1 3	1 5	—

*The Skew tyre is also made in sizes suitable for cycle-cars. †Spencer-Moulton extra strong covers for heavy cars in these sizes and types are also made, prices being in each case £1 extra. ‡A discount of 10 per cent. is allowed off all the prices given of Victor tyres.

THE AUTOCAR, June 14th, 1913.

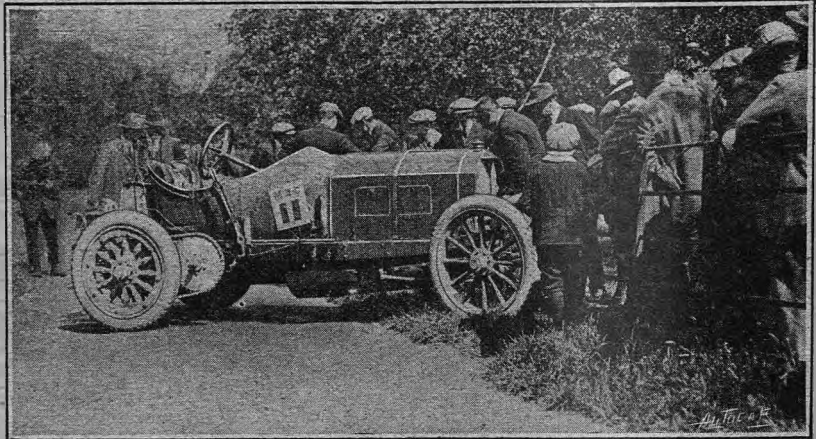
Shelsley Walsh Hill Climb.

Record for the Hill beaten Seven Times. Fastest Time and Formula Awards in Open Event both won by Talbots. Fastest Time of the Day scored by a Vauxhall.

SOME extremely skilful driving was witnessed at the open hill-climb promoted by the Midland Automobile Club on Saturday last. This annual event, which has for some years been considered the classic hill-climb of the year in Great Britain, was for the ninth successive occasion held on the hill in the private grounds of Court House, Shelsley Walsh, by the kind permission of that good sportsman, Mr. T. L. Walker, J.P., the owner of the estate in which the hill lies. Shelsley Walsh is in the midst of most delightful scenery, about thirteen miles north-west of Worcester, and on Saturday last the beautiful valley of the Teme was looking at its best after the freshening effect of the rains of the two or three preceding days. Although some showers occurred in the first part of the day, and the weather outlook at 9 a.m. was distinctly gloomy, yet by 10.30 and from that time onward the sun was shining brightly, so that the crowd of spectators (considered by many a record in number) was able thoroughly to enjoy the meeting.

The record time for the ascent was, until Saturday, held by Mr. H. C. Holder, who in 1911, on his 58 h.p. Daimler, occupied 1m. $2\frac{1}{5}$ s. in the event confined to members of the Midland A.C., but the record for the open event stood at 1m. $3\frac{2}{5}$ s. to the credit of the same car and driver, and was also made in 1911. On Saturday last the record of 1m. $2\frac{1}{5}$ s. was beaten no fewer than seven times, and yet there were many spectators who formed the opinion, before hearing the timekeeper's announcements, that the record had

not been approached by any of the competing cars. Whether this misapprehension was due to the greater skill or experience of the drivers or to the lower centre of gravity of the modern cars as compared with Mr. Holder's car, it is hard to say, but certainly there



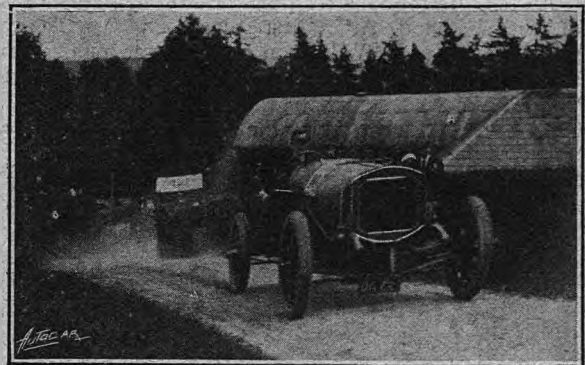
Mr. A. W. Tate's 59.6 h.p. Mercedes shown almost broadside-on across the lower portion of the hill at Shelsley Walsh after it had crashed into the upper orchard railings.

were not those hair-raising skids which *habitues* at this meeting have always expected in the case of the fastest cars. There was skidding in plenty, certainly, but in most cases the two corners on the S bend were taken by a succession of small skids, corrected at their birth almost by instant steering wheel and throttle manipulations. One competitor met with an accident on the lower part of the climb, an accident which might easily have been much more serious in its effects, but which, fortunately, resulted in nothing worse than

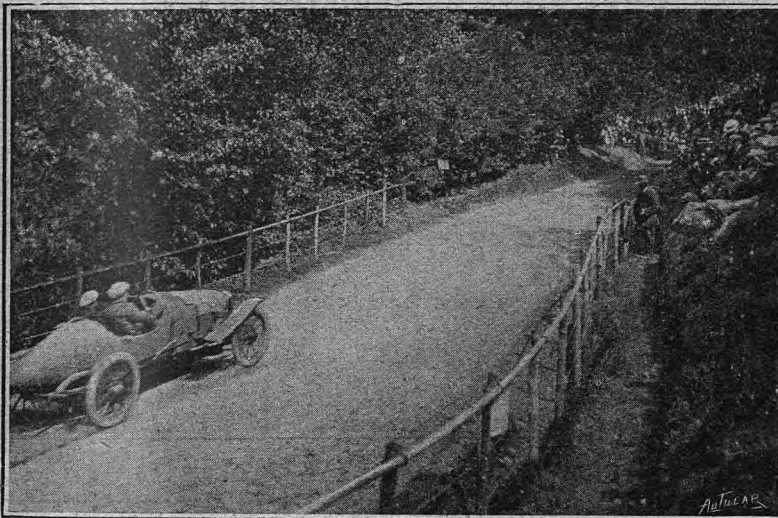


Two views of Mr. A. W. Tate's Mercedes which skidded and struck an iron fence near the start. Both views of the car were taken after the accident, and it will be noticed that a front wheel hub cap which was crumpled up in scraping the fence has been replaced by the top of a loaf of bread to keep out the dust and retain the lubricant.

eight or ten yards of crumpled park railings, two crumpled hub caps, and a damaged radiator. The competitor in question was Mr. A. W. Tate, driving his 59.6 h.p. Mercedes, which has a four-cylinder engine 155 x 170 mm. bore and stroke. On taking the first bend of any consequence, about 100 yards from the start, the back wheels skidded considerably towards the off side and caught in the gutter; this skid was corrected, but apparently to too great an extent, for the back wheels then jumped across the narrow roadway to the near side, struck the railings, and carried them away. Mr. Tate was, however, able to get away from them by a sharp steering movement, but this correction was immediately followed by another slip to the off side, so severe that the car was brought to a standstill by the front part crashing into the rails. For a second or so it appeared to be balanced on the two off-side wheels, but, fortunately, the other two dropped back to earth with the car the right way up. This incident caused some little delay, for the car was broadside across the hill when it came



Mr. Coatalen on the eight-cylinder 80 x 150 mm. Sunbeam just after leaving the starting point.



Mr. C. A. Bird driving the eight-cylinder 80 x 150 mm. Sunbeam. The stretch of road seen is just between the two curves of the S bend.

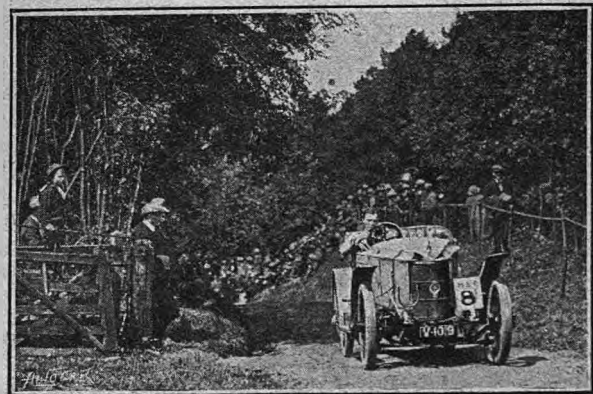
to rest. The rear was, however, lifted round and the car taken back to the starting point. It was not, however, allowed to make another attempt.

The cars which beat the existing record of 62 $\frac{1}{5}$ s. were Mr. J. Higginson's 30-98 h.p. Vauxhall (55 $\frac{1}{5}$ s.) in the club event,; the same car in the team event when Mr. Higginson drove for the Lancashire A.C. (57 $\frac{1}{5}$ s.); the 25 h.p. Talbot driven by Mr. L. Hands in the open event (57 $\frac{1}{5}$ s.); Mr. C. A. Bird's eight-cylinder 80 x 150 mm. Sunbeam (58 $\frac{2}{5}$ s.); the same car driven by Mr. L. Coatalen in the team event (1m. 0 $\frac{1}{5}$ s.); the 30-98 h.p. Vauxhall driven by Mr. A. J. Hancock (59s.); and Mr. C. A. Bird did 60 $\frac{4}{5}$ s. on his Coupe de l'Auto Sunbeam. It will be noticed in the full results tables that Mr. Higginson drove his Vauxhall up the hill three times, and the comparatively long time (1m. 10 $\frac{3}{5}$ s.) taken in the open event is due to the engine misfiring badly on that occasion, as a valve cotter sheared soon after the start.

A number of cars in both open and closed events were entered for the fastest time cups only, and did not weigh in or count in the reckoning for the formula competitions. As previously intimated, the fastest time in the open event was made by Mr. L. Hands on

a 25 h.p. Talbot, and the first on formula was also a Talbot, the 15 h.p. (90 x 140 mm. 3,561 c.c.) driven by Mr. H. G. Day. The weight of this car with load was greater than that of any car competing on formula, i.e., 1 ton 15 cwt. 1 qr. 21 lbs., and its performance in climbing the hill in 1m. 13 $\frac{1}{5}$ s. was a particularly meritorious one, which is borne out by the points scored, 2.164. The only other car to score more than two points was the 12-16 h.p. Sunbeam driven by Mr. E. Genna, which with its 80 x 120 mm. four-cylinder engine (2,413 c.c.) ascended in 1m. 14 $\frac{3}{5}$ s., and scored 2.008 points. The laden weight of this car was exactly 26 cwts. The 20 h.p. Vauxhall (89.6 x 120 mm., 3,027 c.c.) driven by Mr. J. Barber Lomax was third on formula, scoring 1.918 against 1.853 of the 15 h.p. Crossley driven by Mr. C. Bianchi. The latter car was first on formula last year with a slightly better score, i.e., 1.886, its time being $\frac{1}{5}$ s. less than on Saturday, and the weight 49 lbs. more.

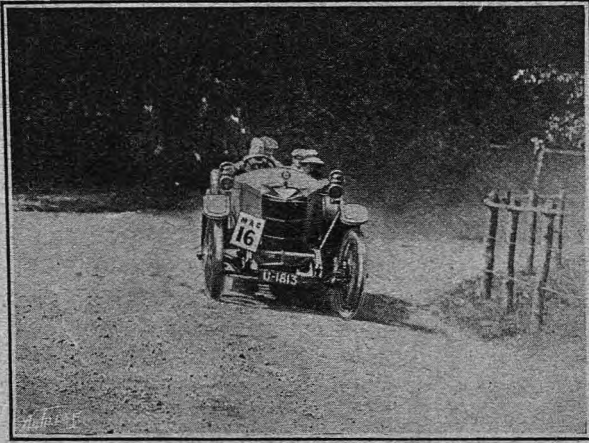
That enthusiastic and skilful lady competitor in hill-climbs, Miss Laura B. Starkey, was a competitor on Saturday and made an excellent climb on her 12-16 h.p. (80 x 150 mm.) Sunbeam in 1m. 35 $\frac{1}{5}$ s., being warmly applauded for her excellent cornering.



The crest of the steep portion of the hill at Shelsley Walsli. Mr. H. W. Cook on the 20 h.p. Vauxhall.

Shelsley Walsh Hill-climb.

As regards the closed event, open only to members of the Midland A.C., first place on formula was secured by Mr. R. Wilkie on a 90 × 120 mm. Vauxhall. His time was 1m. 20 $\frac{1}{5}$ s., and formula award 1.901. Another Vauxhall was second, that driven by Mr. A. Fillingham, while the little 11.9 h.p. Arrol-

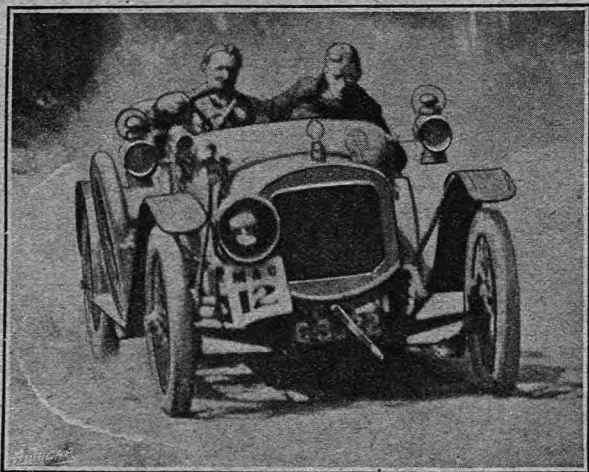


Mr. A. Fillingham driving a 20 h.p. Vauxhall as a representative of the Yorkshire Automobile Club, the winners of the team event.

Johnston, driven by Mr. J. Chilton, was third. The cup presented by Mr. H. C. Holder, J.P., to the amateur entrant of the car, driven by an amateur, showing the best result on formula has not yet been awarded.

The team event open to teams of three cars each, representing clubs associated to the R.A.C., was won by the Yorkshire A.C. represented by three Vauxhalls of identical engine dimensions. The Lancashire A.C. and Midland A.C. were respectively second and third.

For the first time in the history of Shelsley Walsh there was an event for small cars coming under the cycle car definition. The entry was not, however, a



The 12-16 h.p. Sunbeam driven by Mr. E. Genna, which was second on formula in the open event. This photograph gives an idea of the stresses imposed upon the fast cars, for it will be noticed that the whole car appears to be racked to the off-side.

large one, only eight of these little vehicles putting in an appearance. The four-cylinder Calthorpe was successful on the formula results, scoring 1.250 points to the 1.189 points of the second, a G.W.K. driven by



The first competitor of the cycle car event to ascend the hill. The 10-12 h.p. Calthorpe with 62 × 90 mm. four-cylinder engine. The other Calthorpe taking part had an engine of 59 × 100 mm.

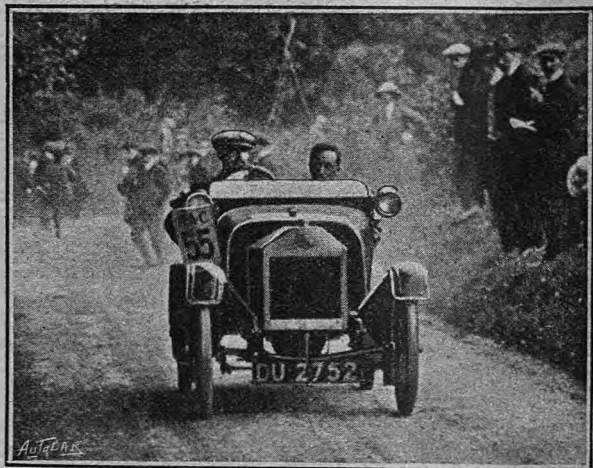
Mr. C. M. Keiller. The Calthorpe has a 1,092 c.e. engine with a bore and stroke of 59 × 100 mm., so that its time, 1m. 35 $\frac{1}{5}$ s., with a laden weight of 1,337 lbs., was extremely good; in fact, it was only



Cars returning from the top of the hill after one of the events. The car in the foreground is Mr. J. Higginson's 30-98 h.p. Vauxhall.

second to the 8 h.p. Morgan of Mr. W. D. South, which occupied 1m. 31 $\frac{2}{5}$ s., the latter car having a two-cylinder 90 × 77.5 mm. engine, 986 c.c., and weighing with load 945 lbs.

The meeting as a whole was voted one of the most successful held by the club, and our only criticism



The 7 h.p. Swift cycle car ascending the hill.

concerns the marshalling of the competing cars. This could certainly be improved upon, as witness the Aston hill-climb of the 24th ult., where the Herts A.C. officials were able to send the cars off with almost clock-like regularity. At Shelsley Walsh there is admittedly not overmuch room at the bottom of the hill for competing cars to manoeuvre, but we think a little more consideration should devise a scheme which

Shelsley Walsh Hill-climb.

would prevent the tedious periods of waiting, on the part of all concerned, for another car to get going. To those on the upper parts of the hill the spacing of the cars occasionally seemed interminable. Apart from this the meeting was conducted admirably, as one has come to expect at Shelsley Walsh.

The following are the full results of the various events:

Open Event.

Car.	Driver.	Bore and Stroke.	No. of Cyls.	Cubic Capacity.	Weight.	H.P. on Formula.	Time.	Marks on Formula.	Placing.	
									Time.	Form
		mm.		c.c.	lbs.		m. s.			
25 h.p. Talbot	L. Hands	101.5 x 140	4	4485	—	30.01	57½	—	1	—
25-30 h.p. Sunbeam	C. A. Bird	80 x 150	8	6032	—	43.46	58½	—	2	—
30-98 h.p. Vauxhall	A. J. Hancock	.98 x 150	4	4526	—	29.47	59	—	3	—
12-16 h.p. Sunbeam	C. A. Bird	80 x 149	4	2996	—	21.66	1 0¼	—	4	—
27 h.p. Metallurgique	O. Cupper	105 x 165	4	5715	—	34.28	1 2½	—	5	—
25-30 h.p. Sunbeam	L. Coatalen	80 x 150	8	6032	—	43.46	1 5	—	6	—
30-98 h.p. Vauxhall	J. Higginson	98.4 x 149.4	4	4574	—	29.59	1 10½	—	7	—
25 h.p. Talbot	W. N. Vinson	101.5 x 140	4	4485	—	30.01	1 12½	—	8	—
15 h.p. Talbot	H. G. Day	90 x 140	4	3561	3969	25.06	1 13½	2.164	9	1
12-16 h.p. Sunbeam	E. Genna	80 x 120	4	2413	2912	19.44	1 14½	2.008	10	2
20 h.p. Vauxhall	J. A. Barber Lomax	89.6 x 120	4	3027	3598	23.04	1 21½	1.918	11	3
20.1 h.p. Vauxhall	H. W. Cook	90 x 120	4	3053	—	23.20	1 24	—	12	—
20 h.p. Vauxhall	A. Fillingham	90 x 120	4	3053	3444	23.05	1 25½	1.7454	13	5
12-15 h.p. D.F.P.	W. O. Bentley	70 x 130	4	2001	2296	16.56	1 27½	1.586	14	11
15 h.p. Crossley	C. Bianchi	79.4 x 123.8	4	2450	3206	19.53	1 28½	1.853	15	4
16-20 h.p. Vauxhall	P. C. Kidner	90 x 118	4	3003	3556	23.00	1 28½	1.745	16	6
16 h.p. Daffracq	George Heath	85 x 130	4	2940	3290	22.16	1 31½	1.628	17	8
12-16 h.p. Sunbeam	Miss L. B. Starkey	80 x 150	4	3016	3367	21.73	1 35½	1.6275	18	9
14 h.p. Humber	W. G. Tuck	75 x 130	4	2297	2597	18.37	1 35½	1.482	19	12
14-18 h.p. Adler	S. Booth	75 x 120	4	2116	2198	17.65	1 48	1.153	20	17
9 h.p. Hillman	H. Nelson-Smith	60 x 120	4	1357	1911	12.63	1 48½	1.391	21	13
11.9 h.p. Arrol-Johnston	J. Reid	69 x 120	4	1795	2863	15.57	1 52½	1.630	22	7
15.9 h.p. Crossley	R. R. S. Harvie	80 x 130	4	2614	3311	20.23	2 0	1.3639	23	14
11 h.p. Humber	W. G. Tuck	69 x 130	4	1944	2450	16.21	2 3½	1.223	24	15
10-16 h.p. Stoewer	G. K. Gilchrist	75 x 88	4	1556	2639	15.11	2 30½	1.161	25	16
12-18 h.p. Riley	Arthur Cox	102 x 127	2	2075	3661	14.31	2 39½	1.601	26	10
12-15 h.p. Calthorpe	G. W. Hands*	69.5 x 125	4	1897	—	16.07	—	—	—	—
59.6 h.p. Mercedes	A. W. Tate†	155 x 170	4	12831	—	62.4	—	—	—	—

Where formula results and weight are not given the car was entered for the fastest time cup only. * Bad start, retired. † Skidded and hit fence, retired.

Closed Event.

Car.	Driver.	Bore and Stroke.	No. of Cyls.	Cubic Capacity.	Weight.	H.P. on Formula.	Time.	Marks on Formula.	Placing.	
									Time.	Form
		mm.		c.c.	lbs.		m. s.			
30-98 h.p. Vauxhall	J. Higginson	98.4 x 149.4	4	4574	—	29.59	55½	—	1	—
58 h.p. Daimler	H. C. Ansell	154 x 140	4	10430	—	56.08	1 7½	—	2	—
12-16 h.p. Sunbeam	C. A. Bird	80 x 149	4	2996	—	21.66	1 8½	—	3	—
25 h.p. Talbot	W. N. Vinson	101.5 x 140	4	4485	—	30.01	1 11½	—	4	—
20 h.p. Vauxhall	A. Fillingham	90 x 120	4	3053	3164	23.05	1 16½	1.787	5	2
20 h.p. Vauxhall	R. Wilkie	90 x 120	4	3053	3514	23.05	1 20½	1.901	6	1
12-16 h.p. Sunbeam	Miss L. B. Starkey	80 x 150	4	3016	3164	21.73	1 28½	1.647	7	4
16-20 h.p. Sunbeam	W. Stokes	90 x 160	4	4070	3948	26.78	1 36½	1.532	8	5
11.9 h.p. Arrol-Johnston	J. Chilton	69 x 120	4	1795	2814	15.57	1 49½	1.650	9	3
12-18 h.p. Riley	Arthur Cox	102 x 127	2	2075	3087	14.31	2 21	1.520	10	6
14 h.p. Delage	E. L. Jacobs	75 x 130	4	2298	3143	18.37	2 24½	1.185	11	7
24-30 h.p. Siddeley-Deasy	G. Heath	90 x 130	6	4960	—	36.21	2 30½	—	12	—
10-16 h.p. Stoewer	G. K. Gilchrist	75 x 88	4	1556	2709	15.11	2 38½	1.133	13	8

Where formula results and weight are not given the car was entered for the fastest time cup only.

Cycle Car Event.

Car.	Driver.	Bore and Stroke.	No. of Cyls.	Cubic Capacity.	Weight.	H.P. on Formula.	Time.	Marks on Formula.	Placing.	
									Time.	Form
		mm.		c.c.	lbs.		m. s.			
8 h.p. Morgan	W. D. South	90 x 77.5	2	986	945	9.32	1 31½	1.109	1	3
10-12 h.p. Calthorpe	G. W. Hands	59 x 100	4	1092	1337	11.24	1 35½	1.250	2	1
8-10 h.p. Morgan	W. H. Lane	81.5 x 95	2	964	854	8.89	1 40½	.955	3	4
8 h.p. G.W.K.	C. M. Keiller	86 x 92	2	1068	1239	9.49	1 49½	1.189	4	2
10-12 h.p. Calthorpe	G. W. Hands	62 x 90	4	1088	1316	11.49	2 18	.830	5	6
7 h.p. Swift	J. W. Griffiths	75 x 110	2	972	1148	8.45	2 28	.918	6	5
8 h.p. G.W.K.	Harold Patteson	86 x 92	2	1068	1393	9.49	3 17½	.74	7	7
8-10 h.p. Super	R. Paget*	85 x 85	2	964	—	8.96	—	—	—	—

* Bad start, did not finish.

Shelsley Walsh Hill-climb.

Team Event.

Car.	Driver.	Bore and Stroke.	No. of Cyls.	Cubic Capacity.	Weight.	H.P. on Formula.	Time.	Marks on Formula.
		mm.		c.c.	lbs.		m. s.	
YORKSHIRE A.C. (1)								
20 h.p. Vauxhall	R. Wilkie	90 × 120	4	3053	3087	23.05	1 17 ² / ₅	.0223
20 h.p. Vauxhall	A. Fillingham	90 × 120	4	3053	3150	23.05	1 5 ² / ₅	.0317
20 h.p. Vauxhall	E. Hoyle	90 × 120	4	3053	2975	23.05	1 14 ² / ₅	.0232
							TOTAL	.0774
LANCASHIRE A.C. (2)								
25 h.p. Napier	W. Bradwell	102 × 178	4	5818	3815	33.87	1 27	.0149
25-30 h.p. Sunbeam	L. Coatalen	80 × 150	8	6032	2681	43.46	1 0 ¹ / ₂	.0170
30-98 h.p. Vauxhall	J. Higginson	98.4 × 149.4	4	4572	2779	29.59	57 ¹ / ₂	.0287
							TOTAL	.0606
MIDLAND A.C. (3)								
16-20 h.p. Sunbeam	W. Stokes	90 × 160	4	4070	3276	26.78	1 19 ¹ / ₂	.0192
12-16 h.p. Sunbeam	C. A. Bird	80 × 149	4	2996	2401	21.66	1 4 ¹ / ₅	.0264
58 h.p. Daimler	H. C. Ansell	154 × 140	4	10430	3570	56.08	1 11 ² / ₅	.0124
							TOTAL	.0580

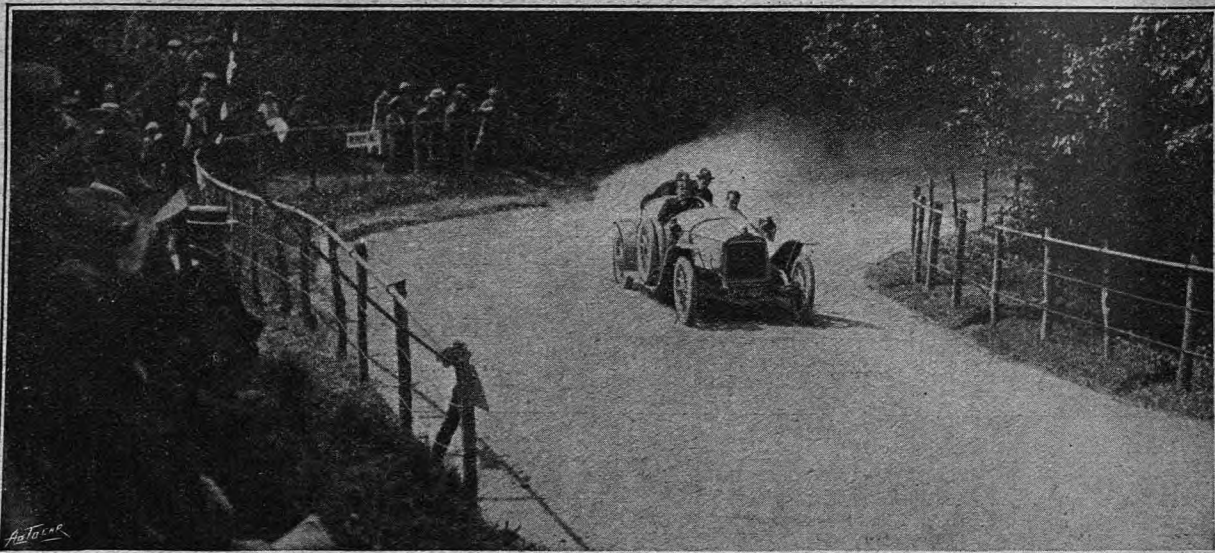
Some Notes on the Competition.

The faster times this year are, no doubt, largely accounted for by the fact that the cars competing for fastest time only were practically without restriction, whereas in previous years cars of over 20 h.p. had four-seated bodies and carried the full complement of passengers, and the five cars which beat the previous record were competing for fastest time only.

One very noticeable feature as compared with the hill-climbs of a few years ago is the greater skill of the drivers, both amateur and professional, in gear changing. We did not hear one bad change on Shelsley Walsh on Saturday, the only indication of a change being the sudden variation in the note: there was no clashing or grinding of gears. We must say that we attribute the improvement mainly to skill on the part of the drivers, because, speaking broadly, gear changing when hill-climbing, especially when climbing as fast as possible, is little if any easier now than it was five years ago.

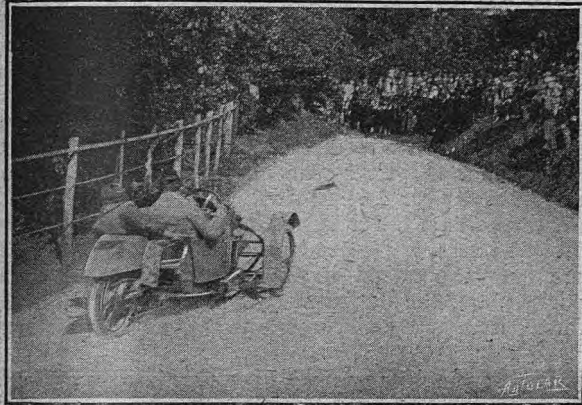
One of the most sensational climbs of the day was made by Mr. Cupper on the Prince Henry Metallurgique. He was not acquainted with the hill, and somewhat under-estimated the severity of the first curve of the S bend, so that he negotiated it in a series of side-slips, half a dozen of which looked serious, but each of which was corrected with remarkable skill and coolness.

The 25 h.p. Talbot, driven by Mr. Leslie Hands, which scored the fastest time in the open event, was driven with extraordinary skill. It was the only one of the fast cars which made perfectly clean circuits of both turns on the S bend. It seemed to be driven at just the limit of speed possible without losing grip on the road at these two critical points. Altogether the Talbots greatly distinguished themselves in the open event, as not only did the 25 h.p. score the fastest time, but the 15 h.p., driven by Mr. H. G. Day, won the formula prize.



The first corner of the S bend and the 15 h.p. Talbot, driven by Mr. H. G. Day. This car was first on formula in the open event, and, though its laden weight was greater than that of any car competing on formula, it climbed the hill in 1 min. 13¹/₂ secs.

The eight-cylinder Sunbeam car, which was driven by Mr. C. A. Bird and, also, by its designer, Mr. Louis Coatalen, was an interesting machine, as it had one of the Monaco boat engines, and, considering the fact



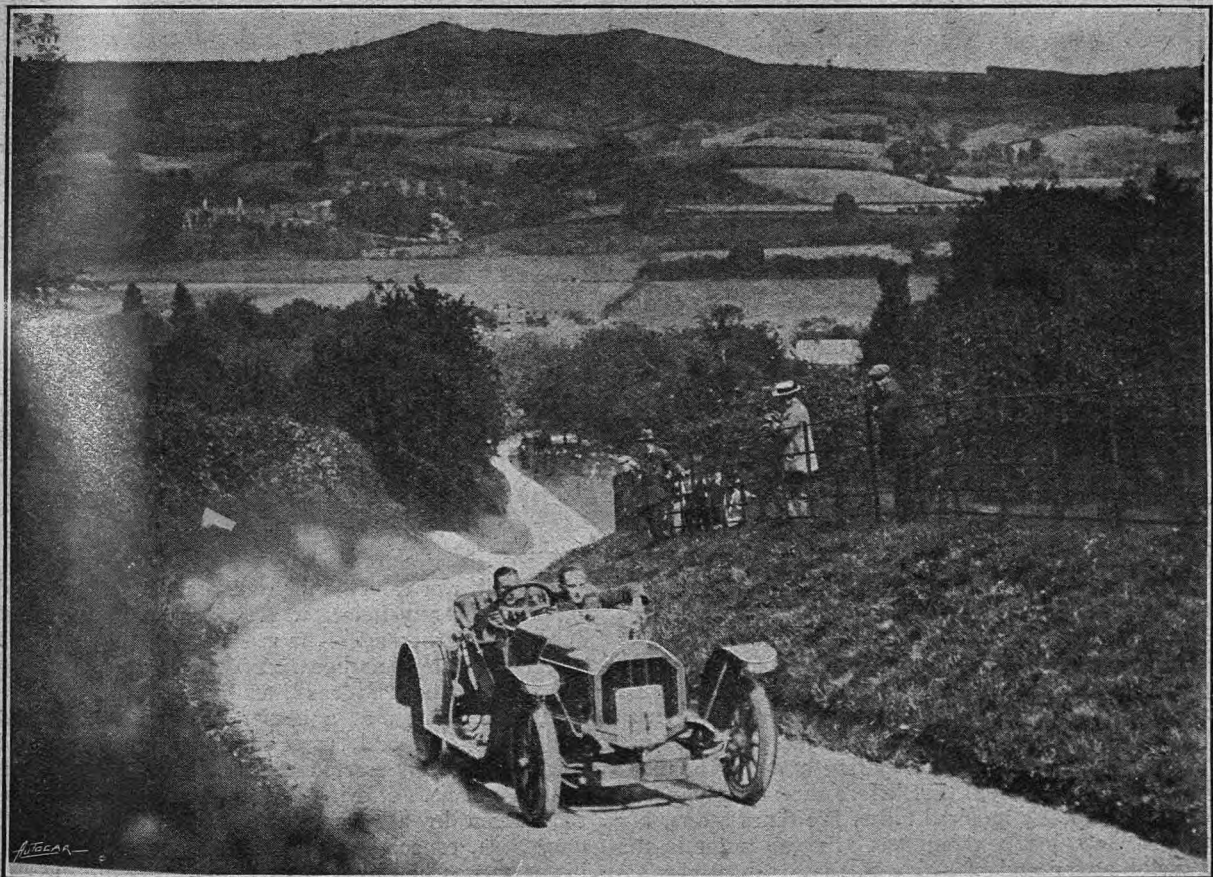
The 8 h.p. 90 x 77.5 mm. Morgan cycle car, driven by Mr. W. D. South, which climbed the hill in 1m. 31½s., with two occupants. An excellent performance which gave it third place on formula and first on time.

that there had not been time to test the car, it did remarkably well; it was only brought from the Wolverhampton works on the morning of the hill-climb, and neither Mr. Bird nor Mr. Coatalen was used to it or knew quite what it would do. Under the circumstances, that it should have been among the five cars which beat record for the hill was highly creditable.

Shelsley Walsh Hill-climb.

So far as could be judged from its performance, it seemed to have a superabundance of power for the weight on the back wheels; in fact, to a large extent this applied to all the fastest cars in the competition. Considering that the radiator was of ordinary Sunbeam width, it was astonishing how little the appearance of the car was altered by the eight-cylinder engine; there was a slight "swelling" on each side of the bonnet and a projecting pipe or two, but they were hardly noticeable when the car was on the move.

The hill is 1,133 yards long and very steep. The actual start is made on 1 in 11, which soon eases slightly to 1 in 12. This is followed by 330 feet averaging 1 in 8.67. Next comes a 245 feet section of 1 in 6.5, succeeded by 330ft. of 1 in 8. This slight easement is followed by 250ft. of 1 in 6.26, and then comes the real crux of the hill, 540ft. averaging 1 in 6.82 for the whole length and including two sharp corners known as the S bend, though, properly speaking, it is not an S bend but a nearly rectangular turn to the left, followed by one not quite so sharp to the right. After this the hill eases to 1 in 12. Then there is 100ft. of 1 in 16, and the run home of some 800ft. of 1 in 10.4. These two last sections are very deceptive: the short landing of a hundred feet of 1 in 16 sets the labouring engine free, and drivers often change up instead of keeping on a low gear for the run in, which optically appears to be almost flat, but is really, as we have said, 1 in 10.4. It will be seen from this that it is not without cause that the Shelsley Walsh event is regarded as the hill-climbing contest of



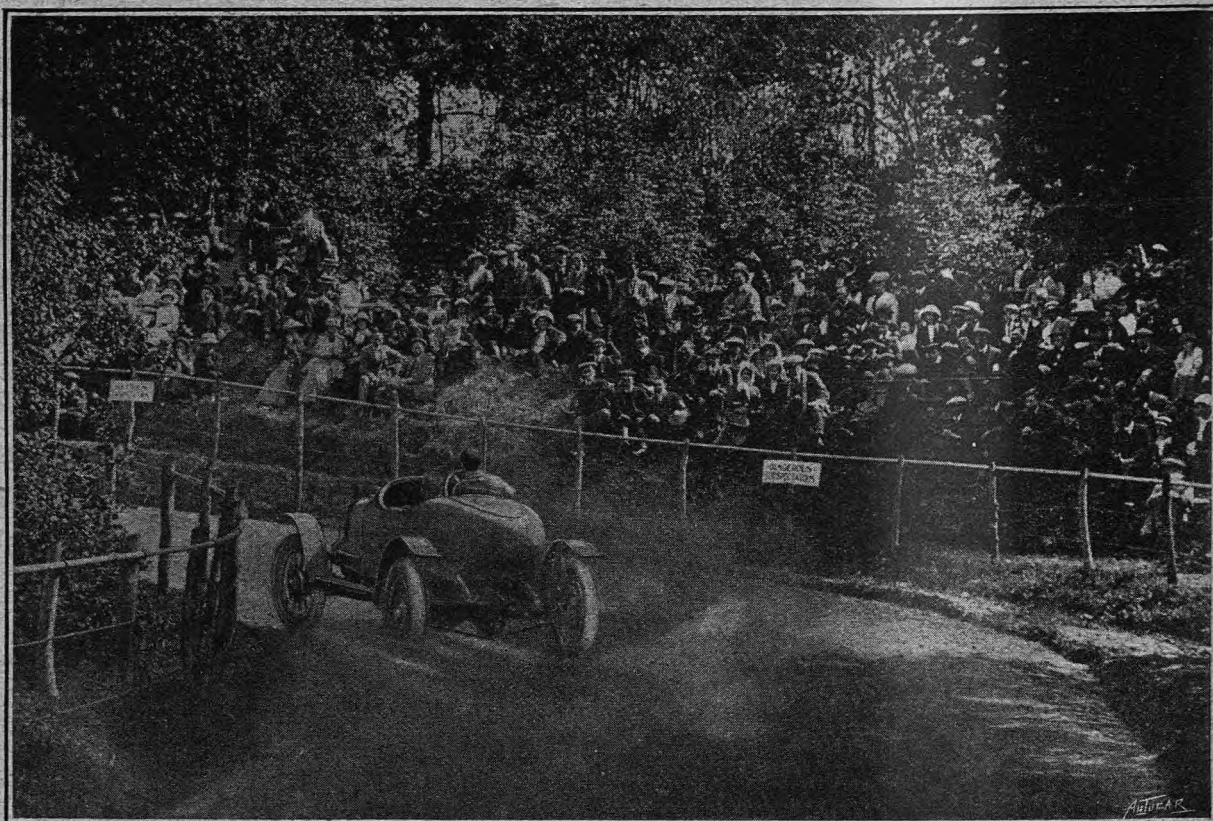
The expansive view across the valley of the Teme from about half way up the hill at Shelsley Walsh. The car ascending the hill is Mr. W. L. Bentley's D.F.P.

Shelsley Walsh Hill-climb.

the year, as we have a really severe hill not only in gradient but also as requiring great skill and judgment, and it is in private grounds, so that the motoring world owes a great debt of gratitude to Mr. Walker for the past two years, and to his predecessor, Mr. Taylor, for allowing the hill to be used for this event.

It is rather interesting to make some notes dealing with the speeds at which the cars entered in the recent Shelsley Walsh hill-climb actually climbed; that is to say, climbed vertically, irrespective of distance in the horizontal direction. The 25 h.p. Talbot, for instance, climbed the height of 350ft. actually included in the competition course, in $57\frac{1}{5}$ s. This represents a climbing speed vertically of 6.12 feet per second, or 367 feet per minute. Probably the machine which climbs at the greatest rate at the present time is the aeroplane. A well-designed aero-

plane to carry two people, and complete with fuel, etc., for a four hours' flight, should be, and usually is, capable of climbing at least 300 feet per minute. One machine which was specially prepared for the altitude record in France a short while ago, namely, the Morane-Saulnier monoplane, fitted with an 80 h.p. Gnome engine and weighing 1,034 lbs. complete, succeeded in climbing at the rate of 1,312 feet per minute—a fact which goes some way to show that the aeroplane is by no means the inefficient mechanical contrivance which some people consider it to be. Seeing that the eight-cylinder engine fitted into the Sunbeam car for the hill-climb is intended, with very slight alterations, for aeroplane work, it might have proved interesting to compare its performance with the results obtained in flight from other aeroplane engines, but the Sunbeam car, being entered for the fastest time cups only, was not weighed at the start.



The 25 h.p. Talbot driven by Mr. L. Hands, which made fastest time in the open event. 'The car is seen taking the first of the corners constituting the S bend.

The foreman engineer of a garage in Wales tells us that recently he fitted a new water pump to an old car, as the old pump was leaking very badly. Two or three days after the new pump had been fitted he happened to meet the chauffeur of the car in question and asked him whether the pump was all right. He was very much surprised to be told that the pump was not working at all, and, upon enquiring how the chauffeur knew this, he was told that before the new pump was fitted the radiator required filling five times a day, but with a new pump there was as much water in the radiator at the end of a day as there was at the beginning. Our correspondent suggests that apparently the chauffeur thought the function of the water circulating pump was to pump the water on to the road.

D6

A number of valuable improvements have been made on the Coventry-Leicester Road *via* Wolvey, Sharnford, and Narborough—the very narrow bridge over the canal at Anstey has been broadened some time now, the road has been widened, and a high hedge replaced with iron palings at a corner between Smockington and Sharnford, and, most important of all, a wide bridge has been erected over the brook at the last named village. Previously it was necessary to cross the stream by a very narrow bridge, rendered very dangerous, especially at night, owing to the fact that it was approached by a short stretch of road only wide enough for one vehicle, followed by a right angle corner at the bridge itself. A little further on another narrow bridge is being widened.

Dumfries to London by Electricity.

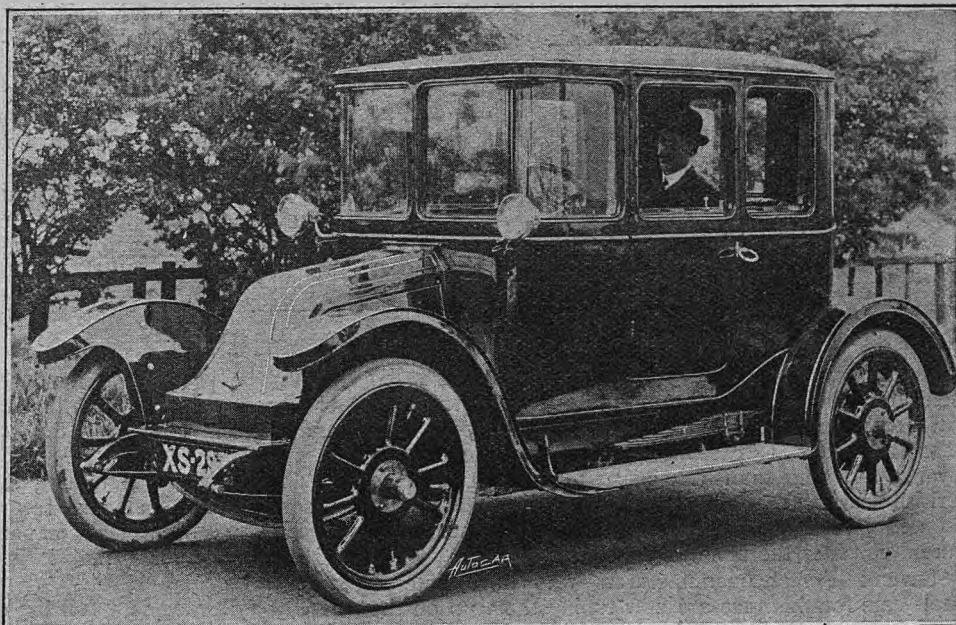
By E. W. Lewis, M.I.A.E.

THE new Arrol-Johnston electric car started from Dumfries, at 3 a.m. on June 9th, having been fully charged at the works before setting out. It arrived at Carlisle at 5.30 a.m., staying for an hour at the electric lighting station there to obtain a further supply of electric current. A stop for breakfast was made at Penrith, where the chief engineer, Mr. Speight, was in readiness to receive the car and to give it a further supply of electric current: By this time there was a very heavy gale blowing, and rain was falling in torrents, so much so that the electricians at Penrith doubted the capability of the car to surmount Shap under the conditions that were prevailing. After having replenished the car and the inner man, the party set out again for Kendal at 10.50 a.m. To the infinite satisfaction of all concerned, the car took Shap splendidly, and on arrival at Kendal at one o'clock was driven to Messrs. Gilbert, Gilkes, and Co., engineers, of that town, where leads were found all ready to put on to the charging terminals of the car, and there was as much current

available as was required, an hour and a half being spent in recharging. A restart was then made for Lancaster, where a further three-quarters of an hour was devoted to recharging, and from Lancaster the car proceeded to Preston, where it also took a small charge. The electrical engineers of the various municipalities all along the route gave the party the warmest welcome. The weather became worse and worse until it was almost intolerable, the rain and the gale combined driving right into the teeth of the driver and making it almost impossible for him to see more than a few yards ahead. With a closed car such as this (a photograph of it is reproduced herewith) any reasonable speed was altogether impossible under the circumstances.

The car arrived at Manchester (Midland Hotel) at about 11 p.m., having given no trouble of any description throughout the whole journey of 156 miles for the day. This distance probably constitutes a record run for an all-electric vehicle in this country in the time occupied. It will be noticed that the charging times were very short, comparatively speaking, thanks to the interest shown by the engineers at the various charging stations at which stops were made. So expeditiously was the charging done that the driver and the press representative, Mr. Warrilow, of *The Electrician*, who was privately observing the car, barely had time or leisure to replenish the inner man.

The remainder of the run, from Manchester to London, was even smoother, as the weather had entirely changed for the better. The running was a repetition of the first day's experiences minus the weather troubles. The first stop after Manchester was Burslem, the second Stafford, the third Walsall, the fourth Birmingham. At Birmingham, it should be noted, the arrangements made by the Corporation Electric Supply Department were everything that could be desired: the officials took a particularly keen



The Arrol-Johnston-Edison electric car.

interest in the vehicle and its performance, and they were, further, kind enough to send a Corporation car to pilot the electric car out of the town, thus facilitating the exit through devious streets from the metropolis of the Midlands on the way to Coventry. The car arrived at Coventry at 9 p.m. on June 10th, stopped forty minutes, then drove on to Rugby, where the kindness of the British Thomson-Houston people in supplying a further amount of current was very much appreciated. After leaving Rugby the car made for Northampton, then to Bedford, thence to London, with a short call at Luton by the way, finally arriving in London at 12.30 p.m. on Wednesday.

Taking the performance as a whole, it must be classed as an unqualified success, and undoubtedly constitutes a record for an electric motor carriage in this country. There have certainly been longer runs made in the States, but I do not think there has been any run made under conditions so trying as those which prevailed on the first day of this trial. The whole cost of current for the first day's run under the worst possible conditions that could be imagined worked out at less than a farthing per mile. The cost of current for the whole journey of 356 miles from Dumfries to London worked out approximately at one-fifth of a penny per mile. It is not proposed in any way to try to supersede the petrol car, as it is well-known that the electric car in its operations is

confined within those areas in which electric current can be obtained; also, it must be remembered that the speed of an electric car compared with that of a petrol car is decidedly low. This run was carried out in order to demonstrate the possibilities of electric traction in this country. In America there are numberless electric vehicles running in the large towns, and they seem to be used for general purposes, and their running cost is considerably lower than that of the petrol car, working out at about two-fifths of the cost. It is not necessary at the moment to enter into technical details in regard to the question of the comparative merits of the two systems, but any of our readers who are interested and would like further information can obtain such either from the Arrol-Johnston Co. or the Edison Accumulator Co., 41, Great Portland Street, London, W.

The car was driven over the entire route by Mr. M. E. Fox, electrical engineer, and was observed, as previously stated, by Mr. Warrilow on behalf of *The Electrician*. The writer, the designer of the car, acted as advance agent, and assisted the engineers at the various power stations *en route* in recharging the vehicle.

Some particulars of the electrical equipment of the car may be of interest. Its equipment in this respect

is sixty cells of 1.2 volts by 150 ampères. The motor is of 3.3 h.p., which seems rather small to drive an automobile, but when one takes into consideration the elasticity of electricity it will be quite understood that the horse-power of the motor is a quantity that cannot be calculated. The wheelbase is 8ft. 4in., the track 4ft. 7in., the road clearance 10½in. The motor is coupled through a cardan-drive to the overhead worm geared back axle. The front springs are the standard half-elliptic; the back springs are of the inverted type, 50in. long. There is a transverse parallel motion confining the axle to a vertical up and down movement, and yet allowing one wheel to surmount an obstacle without putting any strain on the chassis. This parallel motion is a well-trying feature of all Arrol-Johnston cars, and has been already described in *The Autocar*.

The driving control of the vehicle is by one lever mounted on the steering column and connected by a bevel wheel to the controller. The controller gives five speeds forward and three on the reverse. For the first two speeds there is a resistance, for the third speed the motor is coupled in series, for the fourth speed the fields are in series shunted, for the fifth, the highest and most powerful speed, the fields are in parallel shunted.

The French Grand Prix.

As the time approaches for this race, which is to be held on the Picardie Circuit, near Amiens, on July 12th, interest is increasing, and it may be said that this event is exciting much more attention in France this year than last, owing to the fact that the British cars, especially the Sunbeams, showed up so well in last year's race that the French manufacturers consider the result a very open one.

Several French manufacturers who have entered their cars for this race are now tuning them up on the road. Guyot, on his Delage car, has already been practising round the course. A great deal of attention has also been centred in the Peugeot cars, owing to Goux's success in the 500 mile race at Indianapolis.

A considerable amount of work is being carried out over the various portions of the roads forming the course, and in many parts grass has been taken up in order to widen the road. So that the road surface

should be as good as possible, an enormous quantity of concrete has been utilised in repairing the crust, and even in improving the foundations of the roads in places.

The country surrounding the Picardie circuit is so deserted, there being so few villages about, that the Paris motor journals compare it to the Desert of Sahara, concluding that it is an ideal place for the race to be held.

The following is a full list of the entries:

- | | |
|-----------------------------|-------------------------------|
| 1. Sunbeam I. | 11. Itala II. (rotary valve) |
| 2. Sunbeam II. | 12. Itala III. (rotary valve) |
| 3. Sunbeam III. | 13. Opel I. |
| 4. Peugeot I. | 14. Th. Schneider I. |
| 5. Peugeot II. | 15. Th. Schneider II. |
| 6. Peugeot III. | 16. Th. Schneider III. |
| 7. Delage I. | 17. Sunbeam IV. |
| 8. Delage II. | 18. Excelsior I. |
| 9. Mathis I. | 19. Excelsior II. |
| 10. Itala I. (rotary valve) | 20. Th. Schneider IV. |

Last week, in referring to the six-cylinder Armstrong-Whitworth car, we gave the engine dimensions wrongly. They should have been 90 × 150 mm.

* * *

A police trap is working at about the fourth milestone on the road from Brechin to Aberdeen and the North. A ten-mile limit trap has been working for weeks in Prestwick, Ayrshire.

* * *

As we had confidently anticipated, the demonstration of alleged motor polo at Ranelagh recently was not merely inane, but had not the elementary attributes of popularity in it. Thousands went to see the "game" begin; at the end of a quarter of an hour the spectators easily could have been parcelled out in dozens. The verdict was silent, but merciless and swift. Those who know what polo is and ought to be could find no polo in this pretentious exotic from America. Those who know the limitations of the motor car, however skilfully handled, did not need to be told that neither skill nor daring could enable

a reasonably enjoyable sport to be hybridised out of such incompatible materials. We trust that we have seen the last of motor polo, and we can only wonder that those who have adventured their money to exploit it in this country could have been so ill-informed or ill-equipped to gauge English sporting tastes. At the Ranelagh exposition even the convulsively exciting episode of an overturned car in danger of becoming a wreck by fire did not awaken any considerable interest or a desire for a repetition. The sporting motorists that are likely to be satisfied with motor polo are too primal for this old country. We do not object to physical danger, nor do we lack admiration for skill in sport, however obtuse, but we simply have no use for performances that are stupid.—*The Field*.

* * *

The Sunbeam which Guyot drove into fourth place in the 500 miles race at Indianapolis was the old six-cylinder long-distance world's record breaker of 1911. It was entirely his own venture, *i.e.*, he took the car over on his own account and paid his own expenses.

On the Track.

The June Meeting. A Survey of the Entry List.

ENTRIES for the Brooklands Midsummer Meeting on the 21st inst., which we give at the bottom of this page, are quite up to expectations. All the races have filled, and we are to have ten events, the first commencing at 2 p.m. and the last, the Aeroplane Handicap, at 5.40 p.m. Seven of these events are for cars, two for cycles, and one for aeroplanes.

The chief feature of the programme will undoubtedly be the 100 m.p.h. Benzole Handicap, which could not be run off on Whit-Monday owing to the rain. The valuable prizes offered for this race will be competed for by some of the fastest cars on the track, including the new Vauxhall with Hancock at the wheel, the well-known Straker-Squire with Mr. Witchell in control, the Singer and Mr. "Pearley" Lambert, Mr. Watney's Mercedes, and two Sunbeams, one (80 x 120 mm.) entered by Mr. Coatalen, and the other (80 x 149) by Mr. C. A. Bird. Other cars entered for this event are the 89.5 F.I.A.T. owned by Mr. Engley, Mr. Henderson's Kaiser-Preis Isotta, Mr. Hind's Berliet ("Black Beetle"), Mr. Pollak's S.C.A.R., and Mr. Cain's three-litre Calthorpe. A very good point about this race, and indeed all the races at the June Meeting, is the fact that the cars are almost all known to the handicappers, who should be able to gauge their speeds to a nicety, and provide some most exciting finishes.

There are not many new cars in the whole entry list, but we are able to pick out a few, such as the 15.9 h.p. Hispano-Suiza entered by the Hon. Richard Westenra, the 13.9 h.p. Mass of Mr. Ivor Bellairs,

the 22.4 h.p. Buick Bedford of Mr. Edwards, 13.6 h.p. Vermorel of Mr. Cheeseman, of the Automobile Association, and the Hillman car entered by Mr. Nelson Smith. Of these the most interesting promises to be the Hillman, as it is the first of its kind ever entered at a Brooklands Meeting, although it appeared in the All-comers' Handicap at the Royal Automobile Club Meeting on the 31st May, and indeed, the same car, with an engine 60 x 120 mm. It is not to have a special racing body, but will be fitted with an ordinary streamline body. The engine (74 x 120 mm.) is said to be a smart, racy little car, while the Bedford is an ordinary stripped chassis with two bucket seats. It is by no means to be considered in the light of a trade car designed for speed. Mr. Edwards is understood to be merely taking part in racing for the sake of the sport. The car has a bore of 95 mm. and a stroke of 95 mm.

Those who frequent the paddock at the race meetings will be glad to learn that the new stand is nearing completion, and is expected to be ready for the next meeting. It looks as if it would be sufficient to enable one to see over the car shelters towards the railway straight.

Brooklanders will have noted that the 500 mile race at Indianapolis was won by Goux on the Peugeot 77 m.p.h., what time the little Argyll was doing a fourteen hour record at 76.43 m.p.h. and covering more than twice the mileage at Brooklands. There are dirt tracks, and sea sands, and other varieties of motor tracks, but the much maligned Brooklands seems to score here!

Entries for the Brooklands June Meeting.

2.0 p.m. The June Private Competitors' Handicap (about 5½ miles). Prizes—Cups, value £15, £10, and £5.—R. H. Townshend (48.4 Sheffield-Simplex), O. D. Pollak (17.9 S.C.A.R.), Tom Faulkner (24.8 Mercedes), W. M. Dickson (20.1 Vauxhall), R. Robertson-Shersby-Harvie (30.0 Rolland-Pilain), Donald Cohen (15.9 Grégoire), the Hon. R. Westenra (15.9 Hispano-Suiza), J. W. Reed (15.7 Calthorpe), G. N. Cadbury (18.8 Straker-Squire), Paul Mayer (59.6 F.I.A.T.), McL. N. Staight (17.9 S.C.A.R.), and the Hon. Ralph Beckett (23.9 Grégoire).

2.50 p.m. The Eleventh 100 m.p.h. Long Handicap (about 8½ miles). Prizes—£50, £25, £15, or cups at option.—L. R. L. Squire (18.8 Straker-Squire), N. S. Hind (35.7 Berliet), C. R. Engley (89.5 F.I.A.T.), Gordon Watney (48.6 Mercedes), Tom Faulkner (24.8 Mercedes), O. D. Pollak (17.9 S.C.A.R.), C. A. Bird (15.9 Sunbeam), P. C. Kidner (23.8 Vauxhall), A. S. Henderson (52.1 Isotta Fraschini), R. Robertson-Shersby-Harvie (30.0 Rolland-Pilain), Percy E. Lambert (15.9 Singer), and G. T. Cain (15.7 Calthorpe).

3.5 p.m. The First 75 m.p.h. Long Handicap (about 8½ miles). Prizes—Cups, value £30, £15, and £7 10s.—O. D. Pollak (17.9 S.C.A.R.), W. O. Bentley (12.1 D.F.P.), Ivor M. Bellairs (13.9 Mass), W. M. Dickson (20.1 Vauxhall), K. Yano (15.9 Hispano-Suiza), the Hon. R. Westenra (15.9 Hispano-Suiza), G. T. Cain (15.7 Calthorpe), R. A. Keith Mason (8.6 Marlborough), S. G. Cummings (13.9 Cumminikar), E. Herington (15.9 Ariel), T. L. Edwards (22.4 Buick Bedford), G. N. Cadbury (18.8 Straker-Squire), A. B. E. Cheeseman (13.6 Vermorel), Harold Lambert (15.9 Crossley), McL. N. Staight (17.9 S.C.A.R.), S. N. Beattie (17.9 S.C.A.R.), and W. Turner Smith (13.9 Stoewer). Reserves: The Hon. Ralph Beckett (23.9 Grégoire) and H. Nelson Smith (8.9 Hillman).

3.30 p.m. The Twelfth 100 m.p.h. Short Handicap (about 5½ miles). Prizes—£40, £20, £10, or cups at option.—R. H. Townshend (48.4 Sheffield-Simplex), L. R. L. Squire (18.8 Straker-Squire), N. S. Hind (35.7 Berliet), Gordon Watney (48.6 Mercedes), P. C. Kidner (23.8 Vauxhall), C. A. Bird

(15.9 Sunbeam), A. S. Henderson (52.1 Isotta Fraschini), R. Robertson-Shersby-Harvie (30.0 Rolland-Pilain), Percy Lambert (15.9 Singer), and J. W. Reed (15.7 Calthorpe).

3.55 p.m. The First 75 m.p.h. Short Handicap (about 5½ miles). Prizes—Cups, value £25, £12 10s., and £5.—O. D. Pollak (17.9 S.C.A.R.), W. O. Bentley (12.1 D.F.P.), Ivor M. Bellairs (13.9 Mass), W. M. Dickson (20.1 Vauxhall), T. Cain (15.7 Calthorpe), H. E. S. Huth (22.4 Ford), S. Cummings (13.9 Cumminikar), E. Herington (15.9 Ariel), L. Edwards (22.4 Buick Bedford), A. B. E. Cheeseman (13.6 Vermorel), D. Cohen (15.9 Grégoire), Harold Lambert (13.6 Crossley), McL. N. Staight (17.9 S.C.A.R.), S. N. Beattie (17.9 S.C.A.R.), the Hon. Ralph Beckett (23.9 Grégoire) and H. Nelson Smith (8.9 Hillman).

4.20 p.m. The June Sprint Race (a handicap), about 2 miles. Prizes—Cups, value £25, £12 10s., and £7 10s.—R. H. Townshend (48.4 Sheffield-Simplex), L. R. L. Squire (18.8 Straker-Squire), Gordon Watney (48.6 Mercedes), N. S. Hind (35.7 Berliet), O. D. Pollak (17.9 S.C.A.R.), Coatalen (15.9 Sunbeam), P. C. Kidner (23.8 Vauxhall), O. Bentley (12.1 D.F.P.), S. N. Beattie (17.9 S.C.A.R.), McL. N. Staight (17.9 S.C.A.R.), J. W. Reed (15.7 Calthorpe), and Paul Mayer (59.6 F.I.A.T.) Reserve: Percy E. Lambert (15.9 Singer).

5.10 p.m. The 100 m.p.h. Benzole Handicap (about 8½ miles). Prizes—£100 and cup, both presented by the Royal Automobile Club; £50 and £20, presented jointly by the Society of Motor Manufacturers and Traders and the Automobile Association and Motor Union. The benzole will be supplied free to competitors by the Club.—L. R. L. Squire (18.8 Straker-Squire), O. D. Pollak (17.9 S.C.A.R.), C. R. Engley (89.5 F.I.A.T.), Gordon Watney (48.6 Mercedes), N. S. Hind (35.7 Berliet), Percy E. Lambert (15.9 Singer), Tom Faulkner (24.8 Mercedes), Louis Coatalen (15.9 Sunbeam), C. A. Bird (15.9 Sunbeam), P. C. Kidner (23.8 Vauxhall), A. S. Henderson (52.1 Isotta-Fraschini), and G. T. Cain (15.7 Calthorpe).

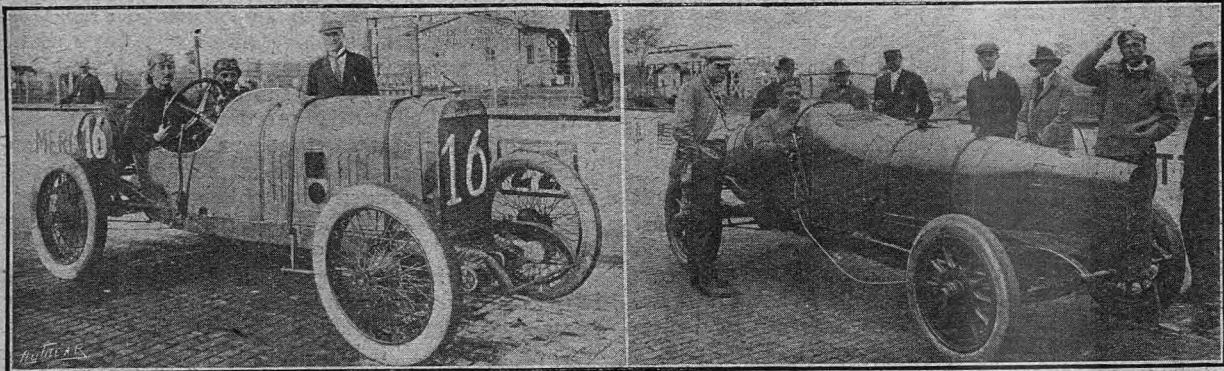
Liquid Fuel from Coal.

A Process which promises 20-25 Gallons from a Ton of Coal. By W. R. Ormandy, D.Sc.

IN a recent editorial in *The Autocar* the suggestion was made that the solution of the benzole question would be found when a coal-treatment process was discovered which had for its main object the production of liquid fuel—the coke and gas being the residuals—the exact words being: “What the motorist wants—whether he can get it is another

yield of 20 to 30 lbs. sulphate of ammonia. The value of the coke depends on the nature of the slack used—that is as to ash contents, but in all cases the coke is very free from sulphur, and in many cases hard enough to use in metallurgical processes.

Experiments on a small scale of 30-50 lbs. are said to support the above claims fully, but a plant to deal



Goux, the winner of the Indianapolis 500 mile race, on his Peugeot. On the right is Guyot on the Sunbeam car which finished fourth.

matter altogether—is a process which will result in so many gallons of benzole or its equivalent being obtained from a ton of coal, that it is a commercial proposition to treat this coal for the sake of its liquid fuel alone, or, at any rate, mainly for its liquid fuel.”

At the time this seemed out of the question, yet in these few weeks a process has come to light which bids fair to realise the seemingly impossible. My difficulty has been to persuade those connected with the work to allow even an inkling of the results to be made public.

In the first place the patent questions have stood in the way, and—more serious—so much harm has been done to low temperature processes by premature advertising that the inventor and those supporting him decided to adopt the wise policy of working the process out to a fair commercial scale before announcing it to the public.

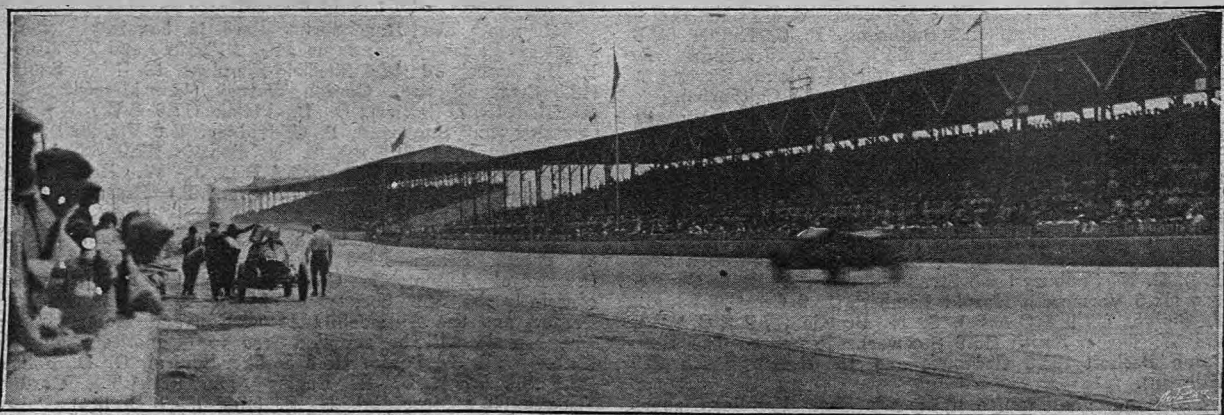
The claims made for the new process are startling enough—a yield of 20-25 gallons of motor fuel from each ton of common bituminous slack and an average

with 10-20 tons a day is being erected, and not until satisfactory results are arrived at with this plant will details be made public.

Those who know anything of the work to be done to convert a 50 lb. laboratory process into a 20 ton commercial one will realise that results will not be to hand for some time, but the fact that good business people are found to be willing to venture on trials on this scale speaks well for their confidence in the small trials. Certainly the principle which underlies the process is simple and rational.

At a time when by-product recovery coke ovens are being erected with ever increasing rapidity it will cause some hesitation and perhaps incredulity in the minds of those who—being concerned—hear of a continuous process producing such yields of valuable products, with a coke which may be suitable for many of the uses to which coke-oven coke is applied, when a washed or clean slack is employed to begin with.

The matter is one which will affect motorists, metallurgists, and colliery owners.



A view of the Indianapolis track on which the 500 mile race was held. The car on the left is the Sunbeam making its first stop for petrol after travelling 210 miles in the race.

Leaves from a Sportsman's Notebook.

By J. Fairfax Blakeborough.

A CORRESPONDENT who adopted the *nom de plume* "Fur Coat" recently wrote a letter to *The Autocar* pointing out how directly and indirectly fox-hunting was indebted to the motorist in rural England. That is to say, those living in rural England who, incidentally, own and use motors. He pleaded for a greater tolerance on the part of masters of hounds for the motor in connection with the sport, and pointed out that there are many occupiers of land, covert owners, fox preservers, and puppy walkers who do not keep hunters, and yet enjoy seeing as much of the sport as possible from their cars. The tendency nowadays is not for toleration but rather ex-communication, so far as the motorist is concerned with the chase. This may seem rather a lack of gratitude *prima facie*; but it must be remembered that the requests to motorists not to come within a quarter of a mile of hounds at the meeting place, and not to allow their servants or friends to attempt to follow hounds when the day's sport has begun, are as much directed against the hundred guinea subscriber to the hunt and the non-riding county magnate as the lesser-known friend of the hunt who walks a puppy or remains mum when his fowls are worried. The broad fact is that the motor car is not only incongruous when the day's sport has begun, but it is also inimical to it. The position was not so serious a decade or so ago as it is to-day, and if motors were allowed to follow hounds as best they can without any curb one trembles to think what the result would be ten years hence.

Motors in Rural England.

Recently I was staying in an isolated part of England amongst the hills, and on several occasions I noticed how important a part motors play nowadays in rural economics. A big car passed me one morning containing a merry party of noble rook shooters bound for a distant woodland, the bang-banging in which one could hear in the distance later. Shortly after it re-passed me, as it was driven back the seven or eight miles, to return yet again with hot luncheon for the shooters. This is a great improvement upon the old pony-trap carried luncheon which never arrived hot, and which joggled the juice from fruit pies over the wine bottles, mixed the salt with the sugar, and generally made a mess of things, as the journey was continued up rough field-roads. The result was that the host's temper was ruffled, and he shot badly (which made his temper still worse). How different was the *modus operandi* on the morning of which I write! Such is evolution.

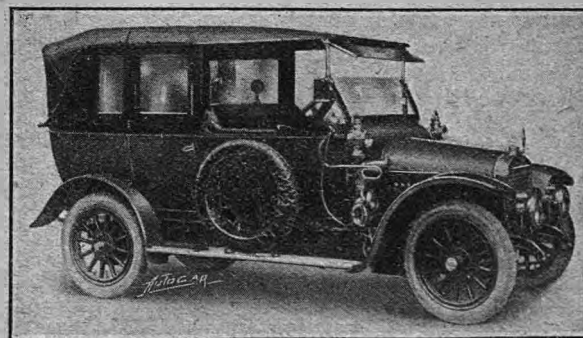
In the evening, as I sat in the smoking room of the old-fashioned hotel at which I was staying, a local squire arrived in his car and with an injured dog. He had wired to the nearest veterinary surgeon—still another six miles away—to meet him there, knowing that the vet., too, had a car and could be at the half-way house almost as soon as the squire and his favourite setter dog. The unfortunate beast had tried to jump a gate and had stuck on the top rail—balanced. The owner had given the animal a helpful shove, but in so doing had rather completed the proverb than otherwise, for he made his dog lame by assisting it over the stile. It caught a hind leg in a bar of the gate and seemed as though it had broken it. The veterinary decided otherwise, however; he bound the dog up in pitch-plaster, and it was soon being driven back home by its owner in his car.

A Motor Funeral.

Nor were these incidents the only evidence which was brought before me of the way in which the car is entering into rural economics. On the following day I saw a motor funeral. A well-known local lady's remains were being conveyed to their last resting place, and most of her friends from a distance had, owing to an impossible train service, come by car to this out of the way spot. There was quite a long procession of motors, and though the coffin itself was carried in all simplicity on one of the estate farm waggons there was a car behind laden with wreaths and floral tributes, and quite fifty private cars containing friends. A rustic, who stood near me—a sightseer like myself—remarked that "it was nowt like a funeral having all them motter cars follering." The *cortège* appealed to me otherwise. The funereal pace of the last sad journey, the sombre attire of those seated in the vehicles, all marked the differentiation from any social or business usage of them, and the very contrast to the customary pace and the atmosphere of importance and hurry, which usually surrounds the motor, all impressed me. Many a broken-down racehorse finds its way into a town funeral cab, and to me this is far more incongruous than motors on such occasions. To meet a thoroughbred horse between the shafts of a cab is the limit of contrast. If one can add to that limit it is to put the racehorse in a funeral procession. Yet many a bad-legged, bad-winded selling plater so ends its days in ignominy and shame. The motor is far less incongruous in connection with the last journey of the departed.

Rook Shooting.

By the time these notes appear in print rook shooting will be at an end. It may seem somewhat of a paradox, but, notwithstanding, it is economy year by year to thin out the cawing colonies in the woodlands and avenues around our old country houses and churches. At the time of writing the fatal crack of the rifle has been echoing for some days, and car loads of sportsmen have been seen travelling through rural England on sport bent. The increase of the popularity of rifle shooting has made men keener on rook potting, for the birds are a test of marksmanship and serve to keep one's hand in. We may be forgiven a little sentimental regret at the slaughter of our dusky friends, which give such a tone and character to those parts of the country in which they settle, but one must remember it keeps the balance of nature right.

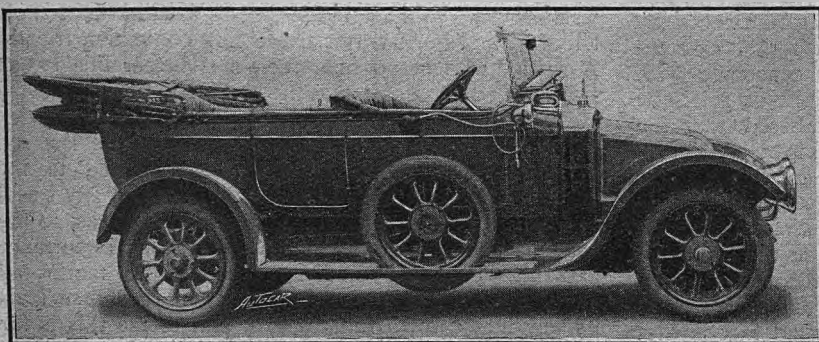


A 15-25 h.p. Adler with a Morgan cabrio-landaulet body belonging to Mr. R. H. Walters, Birkdale, Lancs.

On the Road.

The Renovation of the Roman Roads. The Plague of Bad Tarring.

I WROTE a few weeks back of the behaviour of a new and untested Valveless car lent to me by Messrs. David Brown and Sons, of Huddersfield, and how I suffered from its fuel pipe being filled up with cotton-waste. This car was handed over to me to test, and I have just informed the firm, through its London agents, that, by the look of things, it will have to wait a very long time before I have much of an interesting report to make concerning it. "Story, my masters; I have none to tell," or some phrase like it,



A 15.9 h.p. standard Arrol-Johnston with a five-seated body built in the Arrol-Johnston Works at Paisley. The car has a 10ft. 3in. wheelbase, C.A.V. lighting equipment, Beatonson screen, Kopolapso one man hood, and Sankey detachable wheels.

someone once said. So am I situated, for, although I have driven this machine now some thirteen hundred miles or more, it always goes, goes fast, continues to go, and seems likely to keep going on till all is blue—whatever that phrase may mean.

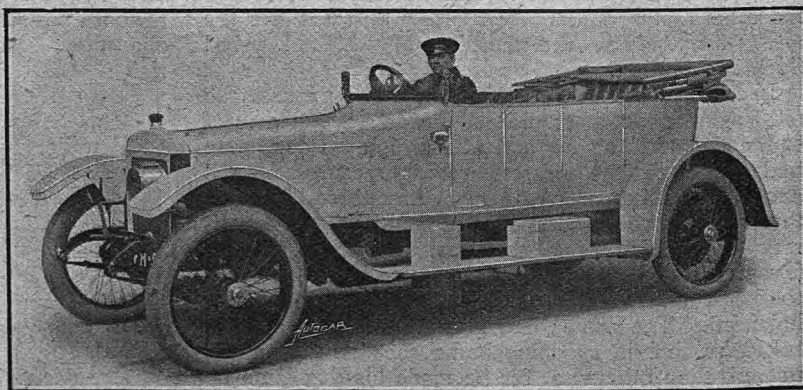
I took a little trip around the Midlands on it a few weeks ago, and I am graciously pleased to remark on the general improvement of the roads in that part of England. I visited about a dozen counties, and, since I have visited them every year for the past ten, I am getting capable of drawing conclusions. But, although one meets more steam rollers and other road-making implements, yet I am not sure one comes across more general commonsense in road-making; for nearly everywhere one can notice an enormous amount of earth and mud being mixed with the stones, while in some cases there seems to be much more earth than stones being put under the flattening machine.

Somerset and Wiltshire roads, apart from the main highways, continue to be made out of a limestone that is more suited for the manufacture of French chalk, while the speciality of Berkshire and Oxfordshire are tiny broken flints that make much-used roads in dry weather look like a sea beach above high water where someone has taken the trouble to smash up the pebbles. But Staffordshire, Salop, Northants, Bucks, Hereford, Worcestershire, and Gloucestershire, to name but a few counties, have, as a rule, excellent surfaces, and a fairly high-powered car, with a bucket seat much too far forward,

is a very fine machine to test roads with. For a purely agricultural county Shropshire, on the whole, is one of the most improved districts, while Leicestershire and Cheshire maintain their high degree of excellence. I have read of late somewhere that the R.A.C., or the R.I.A., or the something, has come to the conclusion that there are no Roman roads not now in use that are worthy of reopening, which is a decision I cannot understand when it is remembered that the London to Shrewsbury, or Holyhead, road has to pass through Coventry, while but a few miles of resurrection would complete the beeline by bringing into use again the old highway where it is lost in the fields to the north-west of Weedon. I dare say other equally useful bits exist, but none where fast through traffic would be better served and could travel more harmlessly. At present the necessary alternative route is over a much too busy road and by far too many towns. But perhaps I am writing in ignorance of some local objection; possibly the authority concerned, having no powers to make such a convenience, declares, like the fox in the fable, it would be of no use if made.

This Watling Street is a fine highway. I stopped to eat my sandwiches one day outside a little wayside inn near Towcester—I never 'phone (as the fearful phrase is) for lunches "to await my arrival"—and as I sat in the one room the landlady showed me all manner of curiosities the navvies bring in, found as they dig the telephone pipe-line trench along the side of the road—old coins, weird horse-shoes, odd bits of steel, parts of guns and pistols, and metal remains of all sorts. Many races and many nations have followed that road, and even now I gather it is a landmark for flying men.

It has had its vicissitudes, too. On the slopes of some of its hills one comes across big paving stones, and at the tops of others there are cuttings, both for the evident object of easing the gradients for weary horses. But why, one may ask, this extraordinary kindness to animals? The answer is a purely



A Daimler with a taper bonnet. This well-conceived body was designed and built by Messrs. Fullers, of Bristol, on a 30 h.p. Daimler chassis, to the order of Mr. Eustace Bouth, Eborworth Park, Stroud. This is Mr. Bouth's third Knight Daimler, the previous cars being the 15 h.p. and 38 h.p. models.

commercial one; for when the Grand Junction Canal was made, and the road-owners found their heavy hauling trade was being diverted, they stopped at nothing to prevent it from leaving them. Hence these easier gradients, and hence the most primitive form of railway. But it was of little avail, for we can read of British soldiers being conveyed from London to Liverpool by canal *en route* for the American War, of fat cattle coming up to Smithfield Show by barge, and of passenger boats, or packets, being run on many lengths of the waterway. But the triumph of the newcomer was short-lived; before ever he had entered into his manhood "Puffing Billy" came along, and now the rejected highway can afford to laugh at its old-time rivals, especially when it considers that the owners of both of them have to pay extra rates to keep it in repair because of the damage heavy traffic—the *raison d'être* of both canal and railway—continues to do to it. A ludicrous system, my masters; but no more absurd than the present petrol tax to hinder locomotion, to cramp trade, and to do no good to anyone at all as long as its proceeds are hoarded up against a rainy day.

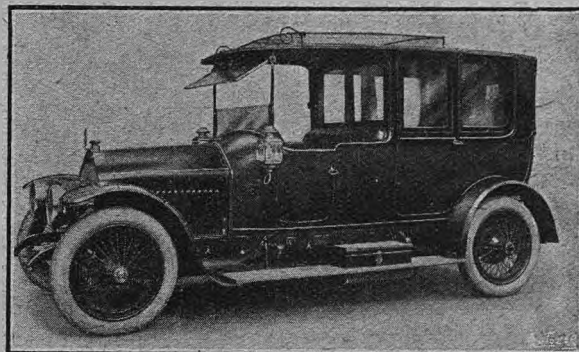
I noticed much tarring of roads everywhere, and I venture to suggest that in places it is not being carried out with full expert knowledge. At Wellington, in Salop—where the Sankey steel wheels are made—as I came through all the streets were half done; that is, all the tar was down and not much of the sand. As luck would have it, while I waited there a tyre went down because of a nail—my first English nail for years—and I put on my spare wheel. This, of course, was nearly flat because I had failed to test it, and to-day that new cover is all tar-covered and my hands were filthy for days and days. In these tarry days, happy is the car that has a works body on it, for, though not so smart as a finished body, tar will do it no damage.



AT THE GRAIGANTLET HILL-CLIMB NEAR BELFAST. A 10 h.p. Grégoire car won three cups, being first in the Open and Trade events, and obtaining also a special cup for the best performance of the day. The hill was just over 1½ miles long, and included four hairpin bends. The Grégoire car made the climb in 2 min. 17 secs. The photograph shows the car rounding one of the bends. The attitude of the passengers is somewhat alarming, not to say dangerous.

On the Road.

One more grievance against Wellington (Salop). I went to the railway station to get a cup of tea, and was told I could not enter unless I paid a penny to go on the platform. Consequently—on a point of principle—I got my tea, a much better one, elsewhere, and later on, in conversation with the stationmaster



A 30-40 h.p. Piccard-Pictet (Argyll sleeve valve type) fitted with a handsome limousine-landaulet body by Messrs. Million-Guiet. It was recently supplied to Mr. W. O. Danckwerts, K.C., by Messrs. Donne and Willans, Ltd., and is the third car of this make supplied to Mr. Danckwerts by this firm.

in Messrs. Shuker and Adams's garage, I asked if the new *ukase* was not being slightly stretched in the direction of silliness. He told me that it was the rule, but that it was relaxed if a townsman desired to buy a *Daily Mail* from the bookstall.

At one town in the mid of the Midlands I was unfortunate enough to come across a typical *table d'hôte*. I asked for something to be cooked for me, suggesting a sole, a chop, and some asparagus. I was told, with no details, there was the usual *table d'hôte* from seven o'clock. I sat down to it, and the

weak soup, the flabby fish, the tough and re-cooked meat, and the horrible sweet were all as nasty as could be imagined, while Mr. Michelin in his guide put the price of it all at no less than five shillings. In honesty I must add I do not think I was charged more than four, but that was far more than its value.

Yet not all hotels are to be grumbled at. As a rule I avoid lunch for reasons of health and figure. But one day I had to wait at Upton-on-Severn about half-past one o'clock, and at the White Lion I read, "Market Ordinary, 2s." I looked in at the long, low market room and sat down. We were all, or mostly, jolly farmers, and in front of the jolliest-looking was put a whole freshly-caught twenty-pound Severn salmon, and after it came the best-cooked foods I have ever seen or tasted. I did not last the courses, but resolved to note for the benefit of humanity how very good such things can be.

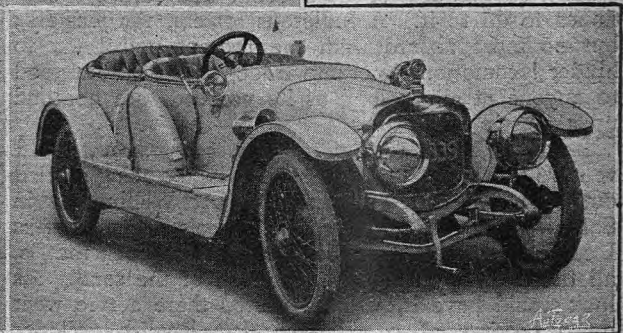
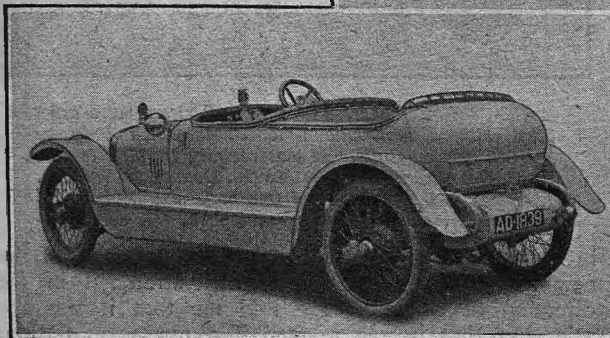
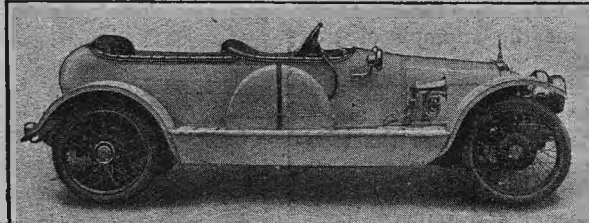
Bad food and bad drink are the worst possible advertisements. At Welshpool—because it was raining—I had a whiskey and soda at one

On the Road.

of its smartest hotels. I can taste that stuff yet whenever I think of it, and never again will I venture. Perhaps I may be told I ought to have ordered a "special" Scotch, which means, I believe, whiskey out of a bottle with a label that it is a well-known brand. Very likely; I am a child in these matters; but it seems an extraordinary thing to me that unless one pays extra one must be given liquor that hurts worse than would the registered motor cocktail, which is, I believe, composed of a glass of petrol and a nut. Perhaps it was Welsh whiskey that I came across; if so, I do not wonder that the pro-

quite a revelation. Its slowness struck me as a remarkable advantage when compared with the ordinary hammer-and-tongs work of the usual poppet valve engine, but a taste of its qualities on the road showed me that a slow running valve did not necessarily imply a slow running car. Its powers of acceleration are remarkable, and I had the luck to see, in the event of a valve sticking, how easy it is to get at the place of trouble.

I cannot help thinking that the trade is making a great mistake in pandering to "nuttness" by making so many semi-racing or racy-looking



A 12-16 h.p. Sunbeam car belonging to Mr. W. Basil Jones, of Pembrokeshire. This car Mr. Jones has already driven 4,000 miles to his entire satisfaction. It will be noted that the body has no doors, hood, or screen, but there is an unobtrusive compartment at the rear of the back seat where oil silk clothing is carried for protection against rain. The running boards are very high, in fact on a level with the chassis frame, so affording accommodation for deep boxes beneath, in which spare petrol tins, tools, etc., can be stored. The body was built by Messrs. King & Co., Hammersmith, London, W.

duct of the Welsh stills is not a great commercial success.

Then I came by that most excellent road to Shrewsbury, where, for a wonder, it was not market-day. What a wonderful place for market-days is Shropshire! One can seldom get a dozen miles without coming into the nucleus or the *débris* of one at least. Every farmer seems to attend one every day, which must be very bad for his own farm, because they are expensive luxuries properly done, and he cannot always have something to buy or sell. Perhaps, in motors, this is what the S.M.M.T., by its fatherly autocracy, prevents when it allows its members to show at the one only and universal Olympia Exhibition.

At the beginning of my little trip I had experience of a new type of engine—the rotary valve Itala. I had only seen these cars at shows before, and the clever way in which the valve mechanism works was

cars. Up and down the main road I live near, on the way to and from Brooklands, pass any number of this type of machine. They cannot all be racers—many of them, I know belong to undergraduates—but as each one opens its exhaust—exhausts still exist and still continue to be used—up the long hill to Huntercombe, they upset my putting and afford others an excuse for missing their drives. One does not meet them in Shropshire, in Lincolnshire, or in Somerset. Why, then, should we motorists and non-motorists in the Home Counties be cursed by their noise and the recklessness of their young and conceited drivers? I wrote several years ago on this subject, and we quietened certain speed-merchants. If I can be of any assistance in getting rid of what is becoming a nuisance my services are still available. Why should the many be damned for the caddishness of the few?

OWEN JOHN.

A Prize of £100 for an Improved Horseshoe Design.

The Roads Improvement Association has now issued the details concerning its horseshoe competition in which £100 is offered for a new, or improved, type of horseshoe that will provide horses with a satisfactory foothold upon the modern smooth waterproof road surfaces and minimise the damage caused to such surfaces by certain types of shoes. The Judges' Committee comprises Mr. Robert Todd (chairman of the R.I.A.), who is acting as chairman; Mr. H. Percy Boulnois and Col. R. E. Crompton, C.B., representative road engineers; Mr. G. E. Fairholme, who has been appointed to represent the Royal Society for the Prevention of Cruelty to Animals, of which body he is

chief secretary; Professor W. Hunting, Mr. F. W. Stanley, and Mr. Thomas Wolseley are the veterinary surgeons on the committee; Mr. Henry J. Selby and Mr. Richard S. Tilling are watching over the horse-owners' interests. The War Office have nominated Col. C. E. Nuthall as their representative. Mr. J. H. Horton and Mr. Alan Lupton, well-known in coaching circles, are also included.

Copies of the rules may be obtained from Mr. Wallace E. Riche, secretary to the Roads Improvement Association, 15, Dartmouth Street, Westminster, London, S.W., and as there is no entrance fee applications should be accompanied by 1d. stamp.

The 15-18 h.p. Hupmobile.

Interesting Unit Construction of Engine, Clutch Pit, and Gear Box. Forced Lubrication without pump. Rear Suspension by a Single Transverse Spring.

THIS is a car which comes to us from the United States with a very sound reputation, which it has certainly sustained since its introduction to this country. It is quite interesting from the point of view of its special design, which, while American in many features, is distinctly peculiar to itself.

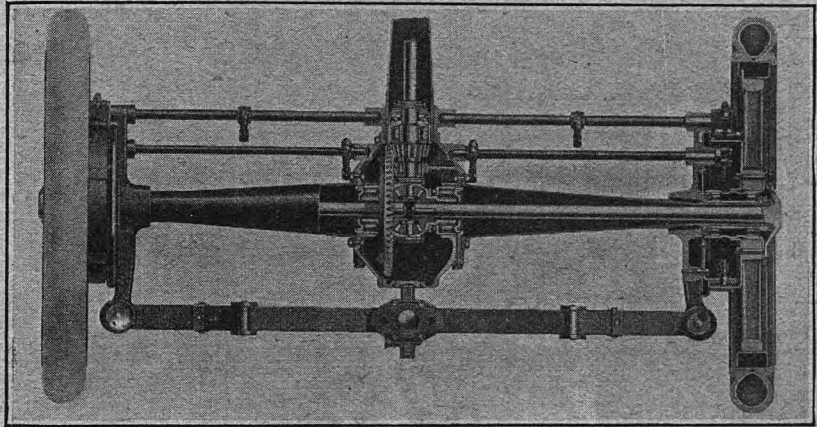
The frame is of deep channel section steel, the side members being slightly in-swept at the dashboard. A cross member at the forward part of the frame supports the radiator, and also the forward end of the motor unit, the rearward end being carried by short brackets from the longitudinals.

The four cylinders of the engine (83 × 140 mm. bore and stroke) form a neat *en bloc* casting, with all the valves on the near side, the valve stems and tappets being very neatly enclosed by two cover plates secured by two thumbscrews. The inlet branch and the exhaust trunk are cast with the cylinder *bloc*. The cast iron pistons are of excellent length, and are provided with three piston rings above the gudgeon pin. The small ends of the connecting rods are fast to the gudgeon pins, which oscillate in sockets formed in the piston walls. The drop forged crankshaft runs in three anti-friction bearings carried in split bronze shells. The camshaft, with which the cams are solid, also runs in three phosphor bronze bearings, and is driven from the back end of the crankshaft (between the rearmost crank bearing and the flywheel) by a silent chain.

The gear box flywheel casing is cast solid with the upper half of the crank chamber, which carries all

bearings, the lower half of the crank case being of pressed steel and flared outwards to meet the lower flanges of the longitudinals, so entirely enclosing the engine space from beneath.

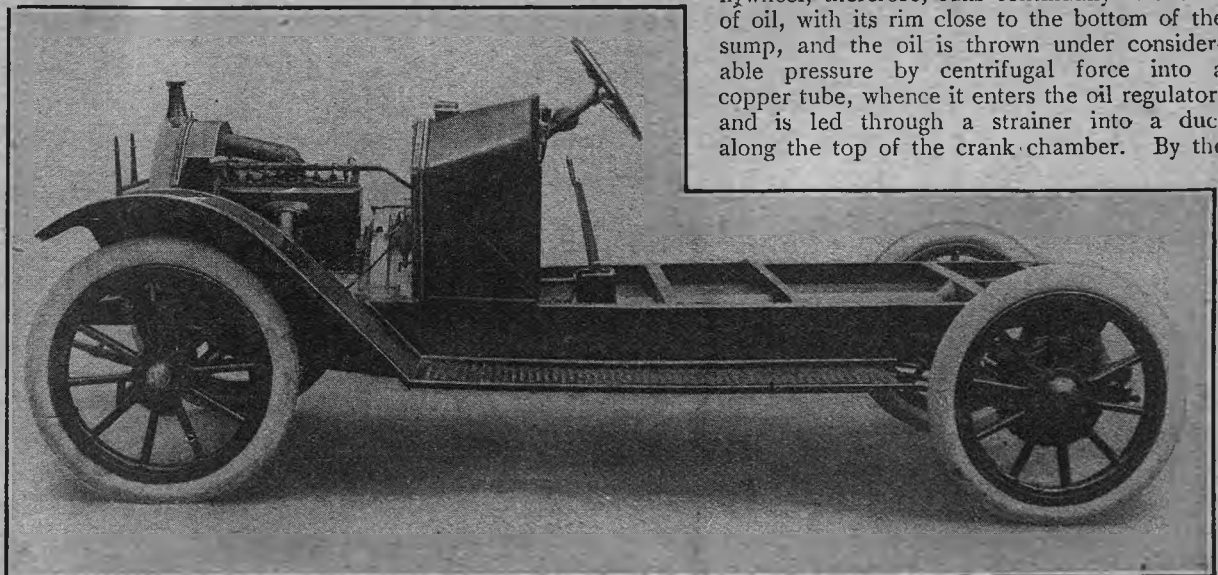
The distribution gear case is (as intimated) at the rear of the engine, while the high tension magneto is set on a table in rear of this case, and driven by a



Part sectional view of the back axle of the 15-18 h.p. Hupmobile. The single transverse spring is anchored at the centre to the chassis frame, and at each end by a spherical joint to a rearwardly projecting member, secured to the axle casing.

wheel rotated by the distribution gear chain. The working face of the magneto projects back through the dashboard, and is very accessible for cleaning and adjustment. The distribution chain has no special arrangement for adjustment, but this is simply effected when necessary by packing up the magneto on its table.

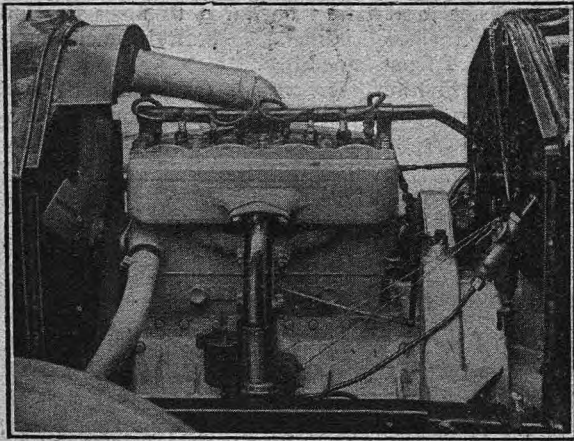
The system of lubrication is unusual. A deep sump is formed by ramping the under cover of the crank chamber rearward, and into the deepest part of this sump the bottom of the flywheel is immersed. The flywheel, therefore, runs continually in a bath of oil, with its rim close to the bottom of the sump, and the oil is thrown under considerable pressure by centrifugal force into a copper tube, whence it enters the oil regulator, and is led through a strainer into a duct along the top of the crank chamber. By the



Near side view of the 15-18 h.p. Hupmobile chassis.

The 15-18 h.p. Hupmobile.

interconnection of throttle and regulator an increased feed of oil is automatically supplied as needed. Three $\frac{1}{4}$ in. tubes conduct the oil to the main bearings, and through suitably formed ducts in the crankshaft to the big end bearings.



Near side view of the engine of the 15-18 h.p. Hupmobile. Attached to the dashboard on the near side is the petrol filter and cock. The neat arrangement of the inlet and exhaust pipes with their branches cast in the cylinder block is noticeable.

Oil leads are provided from the distributing pipe to two points between the cylinders, so lubricating the cylinder walls, while the valve tappets and camshaft bearings are lubricated by the spray thrown from the big ends, oil cups being formed over the camshaft bearings for this purpose. The oil thrown back from the flywheel penetrates to the gear box, and in turn when thrown up by the gear wheels obtains access to the universal joint of the propeller-shaft through a suitable lead. It then returns to the crank case by a pipe leading from the bottom of the torque column casing. The oil is filtered through screens between the successive circuits.

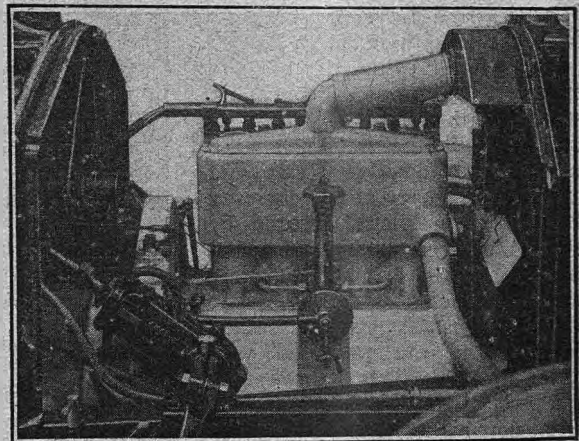
An oil gauge at the rear end of the engine indicates at sight the level of the oil in the sump. Although not a closed circuit, we are assured that the pressure

of oil in the lubrication pipes is from 10 to 14 lbs. per square inch, according to the speed of the engine. A pet cock is provided to prove the circulation and a drain cock to filter. We think it will be agreed that it would be difficult to admit of a simpler and yet more effective system of lubrication.

Thermo-syphon cooling is adopted, the inlet and outlet leads being of good diameter, and an overhang tank is provided at the top of the radiator.

A Zenith pattern carburetter is placed on the near side of the engine. This carburetter is of American manufacture, with optional hot and cold air inlets operated from the central control on the dashboard.

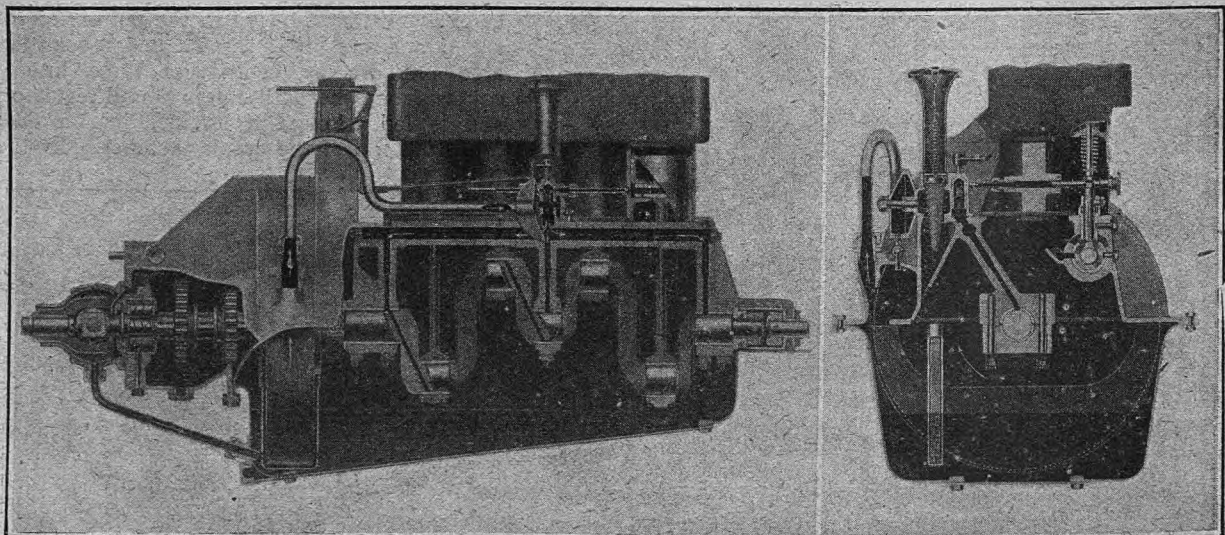
The drive to the gear box is through a multiple disc form of clutch having seven $\frac{1}{2}$ in. saw steel discs. The gear box contains gearing affording three speeds, manipulated by a rocking lever gate change. The



The off side of the Hupmobile engine. Attached opposite the centre of the cylinders is the oil filter and the oil regulator—the latter being inter-connected to the throttle.

change speed lever and the brake lever are set in the centre of the chassis, and therefore operated by the left hand in the case of driving in this country.

The clutchshaft and gearshafts run in Hyatt spiral roller bearings—indeed these bearings, except for those of the engine, obtain throughout the car.



The lubrication system of the 15-18 h.p. Hupmobile engine. The oil is thrown by the flywheel into the pipe leading above it and thence to the crankshaft and connecting rod bearings by ducts. Leads also convey the oil to the cylinder walls. The oil pressure control valve is linked up to the throttle.

The drive is transmitted from the gear box through the universally jointed propeller-shaft contained in a spherically headed torque column, the head of this column being held in a spherical casing forming part of the motor unit casting. The propeller-shaft is carried in Hyatt roller bearings with ball thrusts, and the final drive is through bevel pinion and crown wheel in the usual way, with bevel gear type of differential gearing.

The road wheels rotate on the tapered steel axle casings on four roller bearings, and are connected to the road wheel driving shafts by dog caps. Accessible means are provided for adjusting the bevel pinion to its proper enmeshment with the crown wheel. A ball thrust bearing is provided to the latter.

The whole of the frame is enclosed from radiator to the back axle by steel sheeting, the frame being carried on semi-elliptical springs forward and a form of transverse spring at the rear. This spring is carried in a ball shackle at each end, and in this manner the

chassis frame is practically three point suspended.

Both the pedal and lever applied brakes take effect on the drums attached to the rear wheels. The external contracting brakes, which are lined with Raybestos, are applied by the hand lever; those that are applied by the pedal are of the internal expanding order.

The wheelbase of the chassis is 8ft. 10in., the wheel gauge 4ft. 7in., and the wheels are 810 x 90 mm.

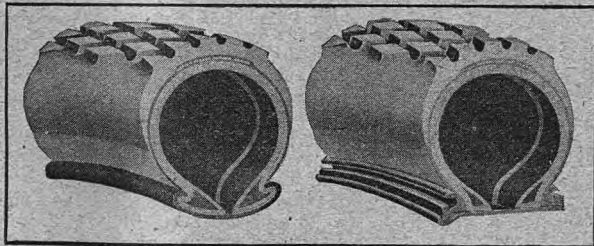
A toggle form of shock absorber is placed between the rear member of the frame and the differential gear case. Rebound snubbers are fitted to each side of the back axle.

The petrol tank is placed on the dashboard, and has a gauze strainer in the filling orifice. The steering is of the worm and sector order, being adjustable from the outside of the box. The steering lever is outside the frame, while the steering arm is above and the distance rod in front of the front axle.

The Goodyear Tyres.

Some Particulars of the All-rubber Non-skid Covers.

THE Goodyear tyres, which have already met with considerable favour on the English market, present several interesting and peculiar features which make very largely for security and durability. The all-rubber non-skid tread calls for special consideration. The diamond-shaped blocks which give so firm a grip on greasy surfaces are splayed at their bases into the substance of the tread, and so resist any cutting and tearing in an eminent degree, while the splayed bases distribute the weight equally on the fabric below.

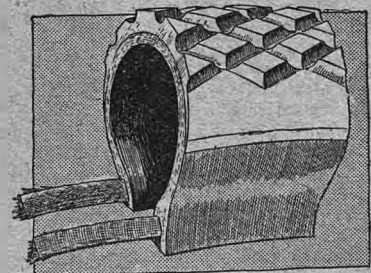


The two types of Goodyear tyres. On the left the usual beaded edge type, and on the right the straight side tyre with detachable flange rim.

The Goodyear tyres are machine made, the fabric used being stretched at an even tension throughout, so that every thread bears its own due part of the load and stress. The carcass of the cover, as it is called, is formed primarily of seven layers of cotton

fabric, which is woven in the Goodyear Tyre and Rubber Co.'s own mills. About and around those layers is a generous layer of pure rubber, upon which the diamond-studded tread is mounted. This pure rubber jacket encases the cover as far as the bead. The carcass with this covering is partially cured, and then completed with the tread in position, so that the whole is firmly merged into one mass, and the tread, having become part and parcel of the carcass, cannot, it is claimed, be torn off. A puncture resisting insertion is mounted on the crown of the cover beneath the tread.

Goodyear tyres are made in two types: (1) with the usual beaded edge, and (2) the no-rim-cut straight side style. The beads of the latter are each formed of 63 strand braided fine gauge piano wire, this construction enabling the straight-sided rim to be used, and the cover to be mounted and detached without stress or levers by the removal of the outer rim ring. This is quite simply and easily effected. Bolt valves are supplied with the inner tubes.



A selection of the straight side type Goodyear tyre showing the inextensible wire woven bead core.

Dunhills' Road Book.

Messrs. Alfred Dunhill, Ltd., have just issued a very handy volume for the tourist in the shape of the "Premier Road Book of Great Britain," giving over 400 plans and contours. The work has been carefully compiled by Alexander Gross and F. Waile-Browne. The routes are plotted in column form, with the contour on the left-hand side of the column and the descriptive matter on the right. This is something on the lines of Patterson's Road Book and Cary's Itinerary, which, however, were innocent of the con-

tour with its elevations. The book is very neatly and clearly printed, and can be used with great convenience while sitting in the car. The steeper gradients are given on the contour, and the locale of golf links, with the number of holes, is indicated. The work is very completely indexed, and a coloured key map is added with the routes numbered to correspond with the plotted sections. This is certainly the best work of its kind we have ever seen at so reasonable a price, i.e., 1s. nett.

The Institution of Automobile Engineers.

A Diary of the Visit to America.

MR. H. MASSAC BUIST, who is one of the party, sends us his log of the visit which a number of members of the Institution of Automobile Engineers and the Society of Motor Manufacturers and Traders are making to the United States of America. We have not, unfortunately, space to spare for the whole of the details, notwithstanding that they would form most interesting reading. We must, therefore, content ourselves with extracts from the record. The first entry is as follows:

SATURDAY, MAY 17TH, 1913.—Among the throng on the platform at St. Pancras Station at 8 a.m. one had no clear idea concerning who were of the Institution of Automobile Engineers' party setting forth to visit those United States and who were passengers proper. Mrs. Basil Joy, wife of the mainspring of the Institution, was there to wish her departing friends God-speed; and President T. B. Browne, supported by his good lady and Member of Council Charles Wheeler, soon emerged from the throng, through which Secretary Joy passed much after the manner of quicksilver in his eager and kindly efforts to help now this one, now that, in embarking on an enterprise that was strange to them. Many kind friends accompanied us quite to Tilbury, among them being veteran Hislop, due to meet us at a later stage in America, and one worthy to bear the name of Campbell and blend the offices of henchman and ancient to Fred S. Bennett. Arrived at Tilbury we walked straight from the station to the good ship *Minnewaska*, of the Atlantic Transport Line, commanded by the genial Captain Thomas F. Gates. The imperturbable and courteous purser, Mr. H. R. Bowden-Smith, helped everybody sort themselves out in almost less than no time, and a pattern surgeon in the person of Dr. E. Seton Pattison mingled among us with a presence that itself served to give a fresh lease of confidence to those who had made up their minds to be sea-sick through the coming voyage, no matter how much akin to the surface of a mill pond it should please the elements to make the boundless main. The signal soon sounded for visitors to quit the ship, and within an hour of our arrival at Tilbury the *Minnewaska* was unmoored and engaged in one of the cleverest exhibitions of manœuvring a 14,000 odd ton vessel in and out of locks and docks I have ever seen. She is the largest vessel that comes up the Thames.

Besides those already named our party includes: Carl F. Benson, C. A. Branston, T. Clarkson, J. B. Ferguson, F. E. Filer, James Inglis Ker, Joseph A. Mackle, J. A. Prestwich, Robert W. Smith, Stanley Smith, and E. B. Wood, as well as Graduates Lucien Bollack and E. Wooler to stand for the *entente cordiale*. The S.M.M.T. quartette consists of the veteran, J. B. Dunlop, C. Gilbert Moore, Tom Norton (of Llandrindod Wells), and E. C. Paskell. Lastly, Mrs. T. B. Browne, Mrs. T. Clarkson, and Mrs. E. B. Wood. We learn that we have 3,270 nautical miles to travel to the Land of Liberty. The fact made Tom Norton foretell that we should need a new set of back tyres before we were through with it.

The events of the voyage are narrated, but as no doubt in actual reality, and apart from the glamour cast upon them by Mr. Buist's inimitable style, they are not uncommon, we must pass them over, too. Nor must we dwell upon the cordiality of the reception accorded to the visitors by their American *confrères*—the beef-steak dinner in the Jungle Room at Healy's Restaurant, New York, on Monday, May 26th, the sight-seeing expedition through New York on Tuesday, May 27th, including a visit to the Automobile Club of America's million-dollar headquarters, where the engine testing and trials plant, the stores (which practically stamp the Club as a co-operative trading society), and the magnificent saloon were inspected and used; the drive into the country by way of the Hudson riverside; the inspection of the motor fire engine appliances of New York, which include a 140 h.p. fire engine, most of the engines having the back wheels steered independently of the front by a second man at the wheel to enable 22ft. wheelbase machines with a good deal

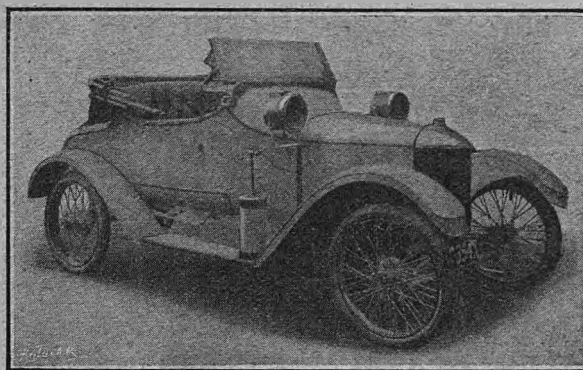
of overhang to negotiate sharp corners; or the other interesting things that engaged their attention. After a brief respite for dinner, in the evening of that busy day they attended the monthly meeting of the Metropolitan Section of the American Society of Engineers to discuss self-starters. The record then continues:

WEDNESDAY, MAY 28TH.—Maybe I am not any longer at sea, but I am certainly on the heaving land. Leaving the Pennsylvania terminal of magnificent features, we have spent the entire day, from five o'clock till eight o'clock, in charge of Big Chief Clarkson and Grouch McMurdy in accomplishing the 440 miles rail journey, passing beneath the Hudson River, skirting the Quaker City of Philadelphia, where motor cars all seem to be driven at a walking pace, and so to the Keystone State, that surpasses all others in iron manufacturers' fuel supplies (bulk of anthracite coal). We beheld the Standard Roller Bearing Co.'s works where Rudge-Whitworth detachable wire wheels are made in Philadelphia; beheld shops and houses "for rent," otherwise to let, espied stores offering "bargains in used cars," and were amazed to discover the more one went into America—the land of Liberty and Equality—that there is an extraordinary absence of personal liberty. You may not pause for a moment in walking through the dining car to pass the time of day with a friend; nor on this long-distance train, which is to be our hotel for three days and nights, may we obtain any alcoholic beverages. Owing to the inter-State liquor laws, the railway company enjoy no licence, hence their trains are strictly temperate zones. Wherever we went we were impressed with the high average of dress. Just as the American working man has the intelligence to keep his teeth in order, with the result that all look well nourished, so he has his clothes pressed regularly. You never see negroes or the poorest whites with a crease in their coats or trousers other than has been put there by the tailor's presser. Nobody wears shabby clothing; no matter how shoddy the material it always looks new. On the other hand, none of the motor papers in a country using many times the number of motor cars employed at home enjoys more than a third of the circulation of *The Autocar*. The private chauffeur rarely reads a journal devoted to automobilism. Such questions as the British Commercial Vehicle Organisation puts to van drivers in connection with its competitions are described by the American technical bodies as questions for engineers, not motormen. The negro attendants on the train sit down in the Pullman observation cars with the passengers. On the other hand, here and down South they are pleasant mannered and obliging, and frequently say "Sir" when addressing you. I habitually heard one or two say "Thank you" when pocketing a handsome gratuity. Our second stop was at Harrisburg, the capital of Pennsylvania, set on the shores of the Susquehanna River, at the gateway to the Blue Mountain Range. Our track took us over the foothills of the Allegheny Range to the Blue Knob, 3,136 feet high. Here the railroad follows for some distance the Juniata River, famed in song, to Altoona. A little beyond this we enjoyed the superb view of the ascent to the famous horseshoe curves, where the train assumes so serpentine a shape that you expect it to "meet itself coming back." At Johnstown we came first in touch with the smoky horror of the steel trust's machinations. Here we had our first peep of metal of glowing heat and furnaces that play ceaseless fireworks for Olympians, what time smoke stacks belch forth endless volumes of chocolate coloured filth that makes sky hideous and industry a grim thing almost to ghastliness. On arrival, nothing daunted by this and dinner taken on the train at 5.30 p.m., "the bunch" made a bee line for a Pittsburg music hall. Being a superior sort of person, I wrote these lines instead, and am now about to set about endeavouring to make up some arrears of sleep.

THURSDAY, MAY 29TH.—A brand new trolley car awaited us at eight o'clock this morning at Shady Side Station to take us to the Pittsburg Athletic Club for breakfast—a grand, simple, square-built headquarters of an organisation established as recently as 1908, and a clubhouse in not a few respects finer and more commodious than our Royal Automobile Club. They think and act big here; yet when, after a tour of the residential quarters by special trolley car, we arrived at the Homestead Steel Works, the largest in the world, albeit only one of about forty in the trust, it was hard to realise that it was the record-breaker. About 7,000 men are employed, and it struck me as amazing that all of them seem to be taking life full easily: it is

the triumph of organisation and machinery. During the last few years a great deal of attention has been devoted to reducing the risk of accident. Steel-making at Pittsburg to-day is safer than farming. Nevertheless they have two doctors and one nurse on duty during the day, as well as one doctor and one nurse at night, together with a completely equipped operating theatre at the works. Thus all accidents involving loss of blood are dealt with on the spot; the rest are treated in the special wards of the Carnegie Hospital in the town. In point of fact, most accidents take the form of nipped fingers. The number of accidents has been reduced 25% this year. Apart from safety committees, there are paid inspectors, whose sole duty is to go constantly about the works examining and reporting. There is also a special staff of police to keep clear the railroads about the works. After the steel is cast colour schemes are employed for keeping track of it. The men are employed on the pension and bonus system, and all work is done in strict rotation, according as the orders have been received—a great improvement on the small steel makers' systems of setting aside work to put through later orders on receipt of a premium for doing so. The handling and lifting of tons of steel by electric magnet, the handling of glowing masses of tons weight with giant tongs, the waltzing cranes of heroic proportions that feed the furnaces with gaunt, stiff steel arms, the roar of cannon as a mass of red-hot metal is run back and forth on rollers as it is quickly beaten into thin, flat sheets, a cascade of water quenching it each time the direction of travel is changed, what time salt is cast on it, and the cutting of the gradually cooling steel into any desired section, no matter what the thickness, are among the hundred and one marvellous processes we beheld. And amid the thunder of it all the men all look well paid, and all go about their business with movements so leisurely that you would think nothing was doing. Apart from making channel section motor car frames, these works produce vast numbers of rolled bevel gear blanks for motors, the first order having been but newly completed with great success, which means a great and speedy development for this fresh department. The fly-wheels, too, are no longer cast, but rolled to the tune of five hundred every twenty-four hours. By this process there can be neither blowhole nor flaw. Gas pockets work out till they show as a blot on the surface, any such example being immediately detected and scrapped. Two and a half years have passed since they began making Vanadium steel here. It has to be subjected to special heat treatment, and is chiefly employed in motor car construction. We also saw the Harveyising treatment of armour plate, and the subsequent handling and shaping of the vast struts, many of them 16in. thick, and scarcely any less

than 14in. Viewing the metal slabs like this makes you wonder how it is possible to build anything that will keep afloat of such stuff. You get another notion of the way things become possible when you learn that in the endeavour to discover improved processes of steel-making it is nothing to spend £50,000 on plant that subsequently proves fit for nothing but the scrap-heap. Employment goes by selection, but the "Hunkeys," those coming fresh into the country and supplying the unskilled labour, commence at from £2 to £2 10s. a week. Their great idea is to save every cent, and buy farms in their native land; hence they live in over-congestion worse than anything the East End of London has to show. It is nothing for a worker of this sort to have a farm of his own after four or five years. As for the skilled labourers, many of them keep motor cars.



The 10 h.p. A.C. light car, a new model with four-cylinder monobloc engine, 59 mm. x 100 mm. bore and stroke. This car is made by Auto Carriers Ltd., Thames Ditton, Surrey, who have until the present time specialised in three-wheeled vehicles with the engine at the back below the seat level. The car shown has engine lubrication by pump to all main bearings and troughs under the connecting rods, Bosch high tension magneto, Zenith carburetter, large diameter leather-faced cone clutch, three-speed gear box, and worm-driven back axle. The radiator, bonnet, dashboard and body merge very gracefully into each other, and the whole presents a very smart and attractive little car. It is fully equipped with hood, screen, three lamps, horn, tyre pump and levers, repair outfit, tools, etc., for £165.

The Spanish Grand Prix.

A Road Race for Fully-equipped Touring Cars.

ENTRIES have now closed for the road race organised by the Royal Automobile Club of Spain, which is to take place on Sunday next, June 15th. They total twenty as follow:

1. 40 h.p. De Dietrich (Marquis de Aulencia).
2. 40-50 h.p. Rolls-Royce (Carlos Salamanca).
3. 40-50 h.p. Rolls-Royce (Geo. Eric Plattford).
4. 25 h.p. Talbot (John W. Hedge).
5. 35 h.p. De Dion Bouton (Juan Pombo).
6. 39 h.p. Minerva (Conde de la Patilla).
7. 28 h.p. Schneider (Marquis de Ugena).
8. 18-24 h.p. Excelsior (Victor Vitalis).
9. 25 h.p. Panhard (J. Labayen).
10. 25 h.p. Panhard (Santibañez).
11. 25 h.p. Panhard (driver not yet known).
12. 20 h.p. De Dion-Bouton (Conde de San Carlos de Pedroso).
13. 16-40 h.p. Mercédès (Duque de Zaragoza).
14. 20 h.p. De Dion Bouton (Marques d'Avray).
15. 12-16 h.p. Sunbeam (Victor Rigal).
16. 12 h.p. S.C.A.R. (Eduardo G. Camino).
17. 14 h.p. Schneider (José Toda).
18. 14-30 h.p. Opel (Juan Román Manzano).
19. 15-20 h.p. Delaunay-Belleville (Juan G. Ocaña).
20. 14 h.p. Humber (Manuel San Román).

It is gratifying to see England so well represented, but it is disappointing and somewhat of a surprise not

to see the name Hispano-Suiza amongst the list, for, as should be well-known, the Hispano-Suiza car is of Spanish origin.

The distance to be covered is 309.5 kilometres (191.89 miles), and the starting point is at La Granja, a small village about sixty miles from Madrid, and where one of the King of Spain's palaces is situated. From La Granja the route goes by way of Navacarrada to a point where the road from Villalba to Segovia crosses that from Madrid to Corunna, then back through Guadarrama, Alto del León, San Rafael, Revenga, and Segovia to La Granja. There are many sharp ascents and descents, as the course includes the Guadarrama Mountains; sharp corners and hairpin turns are not uncommon, but we understand that the surface has been well prepared, and that it is in really good condition.

All cars entered must be provided with fully equipped four-seated bodies, including a hood, lamps, mudguards, and two spare covers. Speed on hills, speed on the level, and petrol consumption will be taken into account in making the awards, which are in the form of cash prizes.

The 25 h.p. Vauxhall.

An Appreciation of its Running on a Trial Trip.

WE have written a trial trip, but such a distance as one can encompass on a modern motor car in a few hours is really no sort of trial as things go in these days. Nevertheless, a run of 100 miles or so will enable those who have cars in the blood to form a very fair opinion of the qualities and points of any vehicle on which they may take the wheel. Consequently, though we had been, for many months, on what we might describe as quite familiar terms with the mechanical details of the new 25 h.p. Vauxhall, it was not until a few days ago that we, thanks to the kind suggestion of Mr. Laurence Pomeroy, its designer, were able to become intimate with the running of this remarkable car.

To refresh our readers' memories, we may as well recall the salient dimensions of one of the Vauxhall Co.'s most creditable productions. The four-cylinder engine has cylinders 95 mm. bore \times 140 mm. stroke, a combination which, properly dealt with, promises power, flexibility, and quietude. With such a genesis it is, of course, unnecessary to add that the gear box affords four speeds, and that the bevel drive to the back axle is at a ratio of 3.3 to 1 with 820 \times 120 mm. wheels.

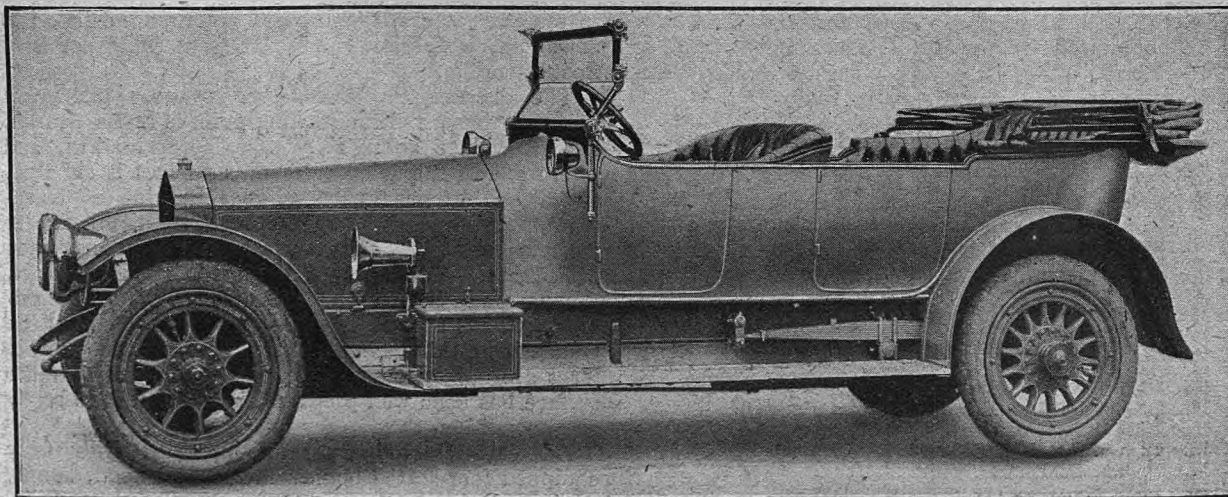
On the trip under review the issue from London was by the Finchley Road to Barnet and St. Albans, and then *via* the Holyhead Road to Stony Stratford and back—an easy road, certainly, so far as gradients are concerned, but still one upon which flexibility, acceleration, and slow running could be satisfactorily tested. Getting out of London about eleven o'clock, the traffic is dense enough to test the flexibility of any car, and it was indeed gratifying to find how the 25 h.p. could be niggled through the press on top speed without a quiver. Its rapid acceleration and instant response to the throttle pedal enabled the best advantage to be taken of any clear space, so that the more congested thoroughfares were soon left behind.

To-day an open throttle is almost impossible until Barnet has been left behind. Ridge Hill, once the terror of cyclists, had no existence for this

car, and thereafter there was little to trouble but the pitch beyond Hockliffe. At times it was possible to travel at a really high speed, but from the minimum to the maximum range of revs. there was absolutely no engine period whatsoever, felt or audible. At times the revolutions must have been over 1,700 per minute, but the engine seemed as smooth then as at half the speed.

To the driver who can appreciate power and docility in excellent combination a real treat awaits him in the conning of a 25 h.p. Vauxhall, for, while it will handle like a cycle car at low speed, it is as steady as a North-Western corridor train when running all out.

One would naturally expect to find the remaining details of the car equal in every way to the transmission, and they are so. The brakes, while amply powerful, are sweetly progressive, and either is sufficient for any average emergency. Of the springing we cannot speak too highly, for north of Dunstable the pot-holeyness of the Holyhead Road is a scandal to behold, and nothing is so trying to the springing economy of a car as rapid passage over a badly pot-holed road. On the completion of our trip we fear we must confess that we relinquished the wheel of the 25 h.p. Vauxhall with keen regret both for the closing of a delightful experience and the fact that the car was not going to take up permanent residence in our own motor house. It should be borne in mind our trip was made on an ordinary Vauxhall with full-sized five-seated open body, hood, screen, and wood wheels. The Prince Henry model, which has the same size of engine with a somewhat more open distribution, shorter wheelbase, wire wheels, and an altogether lighter body, is a still more lively entity, as the power is somewhat greater and the weight to be propelled considerably less. We hope on some future occasion to put this model through its paces, but it will have to be superlatively good to beat the ordinary touring model, with which we have been dealing, as a combination of all-round comfort, speed, and sweetness of running.



A 40-50 h.p. Rolls-Royce car which has been delivered to Dr. W. M. Allen, Sandyford Place, Glasgow, by White-Coleman Motors, Ltd. The body is by Cann, and is finished in mouse grey, the upholstery being in deep brown. Warland Dual rims, a C.A.V. lighting outfit, and a Kopolapso hood are used.

The Isle of Man Race.

The Attitude of the S.M.M.T. A Communication from the Royal Automobile Club.

THE following communication has been received from the Royal Automobile Club in regard to the attitude and procedure of the S.M.M.T. in the matter of the proposed, but now abandoned, race in the Isle of Man, which was to be held in September next:

On October 29th last the Competitions Committee of the Club decided to make certain recommendations to the Committee of the Club for an international race in the Isle of Man in 1913. These recommendations were approved. On November 21st the Competitions Committee discussed the race further, and agreed that the suggested basis of the race should be discussed with representatives of the Society of Motor Manufacturers and Traders.

A meeting was held on December 19th, as the result of which the Club anticipated no obstacle. On December 30th the basis of the regulations was sent to the Society. The Competitions Committee amended the first draft of the regulations in accordance with the views expressed at the meeting above referred to.

A further meeting was convened for January 16th, but as only one out of the three representatives of the Society could attend the meeting was cancelled.

On January 22nd the following letter was sent to the secretary of the Society:

"Isle of Man Race.

"Dear Sir,—Herewith I have pleasure in enclosing two copies of the revised draft of the conditions for the proposed Isle of Man race in September next. The revised draft was prepared at the last meeting of the Competitions Committee on Tuesday, the 14th inst., and was to have been submitted to the meeting of the joint committee of the Club and the Society on the 16th inst., but the latter meeting was cancelled.

"Yours faithfully,
"J. W. ORDE, Secretary."

The Society then suggested a joint meeting between a committee specially appointed and the Competitions Committee of the Club. To this the Club agreed. At this meeting, the representatives of the Society pointed out that there was not sufficient time to have the race in 1913, as, by the regulations, makers would have to build cars specially for it. The Club acquiesced and said that these or similar regulations would be put forward for a race in 1914, and that, instead, it would hold a race for "stock" cars in 1913, this being on similar lines to the Standard Car Races held in 1911 and 1912. The Society was notified of this arrangement on the 18th of February. On the 28th of February, the Society informed the Club that it could not support any race in 1913.

On receipt of this letter, the Club invited the press to luncheon (12th of March), explained the regulations for the race for "stock" cars in 1913, and informed the press that, while the race would not have the support of the Society it would not oppose it. The letter from the Society was understood to convey that meaning.

On the 14th of March, as an act of courtesy, the Club

forwarded to the Society copies of the regulations for the "stock" car race in 1913. In answer, the Club received the following letter, dated 28th of March.

"Isle of Man Race, 1913.

"Dear Sir.—Referring to your letter of the 14th inst., I am directed to inform you that the regulations to govern the proposed race for stock cars this year have been considered by the Council of the Society, when the following resolution was unanimously passed, viz:

"That the regulations are such as would be harmful to the industry and the public alike, and that consequently the proposed event cannot be approved."

"Yours faithfully,

"T. F. WOODFINE, Secretary.

Without affording the Club any details or reasons which led up to the above resolution, the Society then issued to its members a letter forbidding them to enter for the 1913 "stock" car race under the penalties of their bond. Needless to say, this took the Club very much by surprise, such an act being contrary to the methods usually employed between two friendly organisations.

At a later date, on its own initiative, the Council of the Society reconsidered its decision to ban the race of 1913 altogether as shown in the following letter sent by the Society to the Club on the 16th May:

"National Tourist Trophy Stock Car Race, 1913.

"Dear Sir,—I am directed to inform you that the Council of the Society has resolved not to consider any entry for the above race an infringement of the bond, provided (1) that the cars are owned and driven by amateurs, and (2) that no assistance, direct or indirect, be given by the trade to those taking part in the race.

"Yours faithfully,

"T. F. WOODFINE, Secretary."

This is the first time that the Society has claimed to have any jurisdiction over the private owner, and the Club has every intention of opposing such a claim. The Club will also oppose the Society in its dictum that a private owner may not have his car repaired or tuned up as and where he thinks fit. Further, the Club would point out that the letter from the Society is totally at variance with its former letter, in which it was stated that "the regulations are such as would be harmful to the industry and the public alike," as any race which is contrary to the interests of the trade and the public when open to professionals could certainly not be said to be altered if only amateur owners and drivers were allowed to compete.

The Society obviously has no power to control the private owner nor to legislate how he shall deal with his own cars or what firm he shall employ to tune up or do work on them.

The effect of the Society's action will be to penalise the small firms (over twenty of which made close enquiry at the Club into the conditions with a view to entering) as they have everything to gain by competing in the Isle of Man, whereas the large firms have little to gain and, perhaps, something to lose in the event of their failure to win the race.

Last week (page 1038) we gave some particulars of the record breaking Argyll and of the few ways in which it varied from standard. A particularly interesting item of information which we were not then authorised to give is in regard to the cylinder heads. It will be remembered that in the Argyll engine the cylinder head takes the form of a plug, or drum, as it projects downward into the cylinder with an annular space between it and the cylinder walls, and on this drum the sleeve slides. As is the case with all other sleeve valve engines, this head had rings like piston rings so as to make a good seal between the sleeve and the head, but these rings were omitted from the record breaking car. It will also be remembered that an Argyll car was run without rings prior to the litigation last autumn, and at that time one eminent expert expressed the opinion that, without rings in the head, the engine would speedily knock itself to pieces.

Yet the fact remains that after its two long distance record attempts on Brooklands at sustained average speeds of nearly seventy-five miles an hour for twenty-eight hours the engine when partly taken down was found free from any signs of slackness or defects; indeed, its condition was so good that the parts were simply put together again for further work. Incidentally, too, the record breaking runs on Brooklands demonstrated the efficiency of the Argyll diagonal brakes. It will be remembered that these brakes are constructed on a principle which we advocated many years ago; that is to say, one pair of brakes operates on, say, the left front wheel and the right back wheel, while the other works on the right front wheel and the left back wheel. This gives a much less disturbing effect on the car when checking speed than does the conventional arrangement of both brakes on the back wheels only.

The New American.

By R.A.C. Guide Charles H. Ashdown, F.R.G.S.

THE method of sight-seeing adopted by the American tourist for many years formed the subject of a pleasant gibe, and the lightning-like rapidity with which he flashed through places of interest and covered the intervening space between them has met with much gentle sarcasm. The tale of the visitor, who, in a paroxysm of intense gratitude, pressed a sovereign into the hands of a verger through whose instrumentality he had been conducted to every part of Canterbury Cathedral in seven and a half minutes is well known, and many other equally expeditious feats of hustling round are familiar to all.

The stereotype American "Pilgrim's Way" has, until recently, been a beaten track which few sought to enlarge: a call at Jordans and a scurry to Oxford; a scramble through Shakespeare country and a dash to Chester formed, with the majority, the only part of England worth seeing, and became the regulation prelude for a descent upon the Continent.

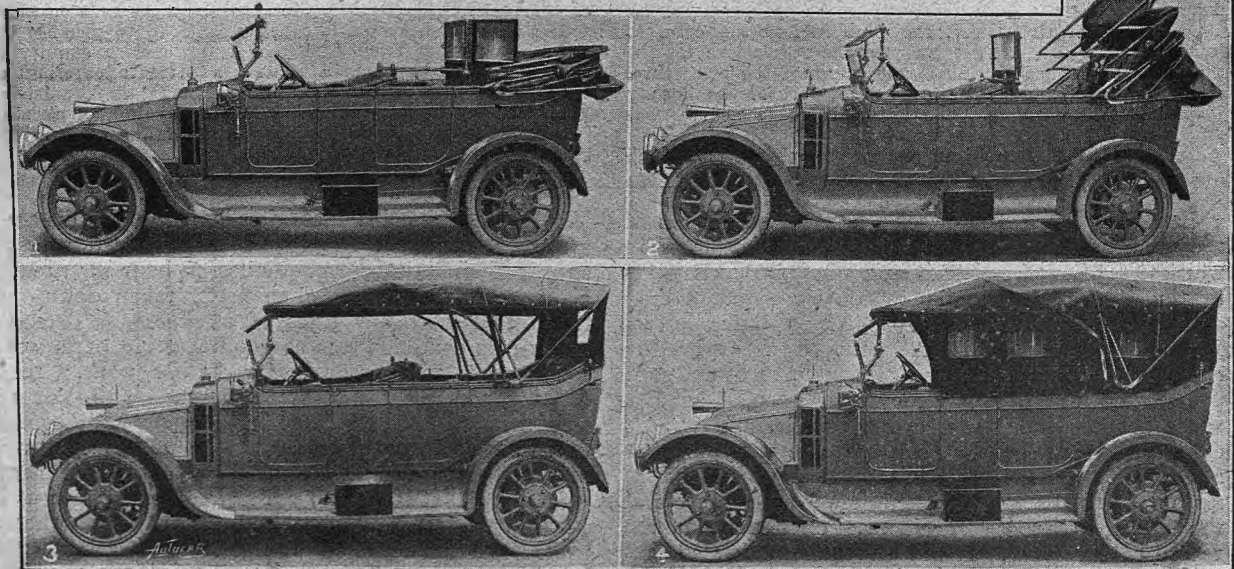
It is with a feeling of satisfaction that one is able to testify that, so far as personal observations justify the assertion, a healthy reaction is gradually superseding the old feverish rush, and a number of signs are not wanting to point to better conditions obtaining in the future.

These convictions are the result of observations extending over the last three years, and are based upon experiences in conducting American motoring visitors, of practically all denominations, in my own county and elsewhere. Some of the ideas embodied in this article may have crystallised during a tour, approaching a thousand miles, just terminated. The glamour, delight, and rapture of a 60 h.p. American White car, specially built this year for a run through the Continent and a glimpse at the physical beauties of the Old Country, are still upon me; the latter are immeasurably accentuated by the charming personalities of well-travelled American ladies—than whom no greater epitomes of intellectual and personal attractions exist—and the company of well-read men.

The car was a revelation of all the latest improvements, from self-starter onwards, with tyres of such a diameter that no garage from Machynlleth to Southampton could supply a substitute of one that punctured, while judiciously placed shock absorbers aided in rendering it the beau-ideal of comfort and luxury. Alas! it is at the moment of writing in the hold of the *Olympic*, and England is the poorer for it. It swept through Snowdonia and the switchbacks of Cader with the same ease that the Thames Valley and Shakespeare Land were negotiated, and even the "sudden deaths" of parts of the Wye and Severn Valleys were mostly taken upon top gear. The roads throughout were kind to us, except, of course, from Corwen to Cerrig-y-Druidion, while Cross Foxes was in marked contradistinction to that of last year, when the struggles of a powerful Daimler through a quagmire of mud, metal, and mire will ever live in my recollection.

It is not the great things alone which our country is able to show them in the way of cathedrals, castles, colleges, and museums that appeal to a large number of the Americans who are at present visiting these islands; they are gradually awakening to the fact that the little things of our everyday life, both of the present and of the past, possess a wealth of superlative interest for them hitherto unsuspected. I have known more interest evoked by the time-worn stocks and whipping post of a sequestered village than by a famous Titian; and more pleasure expressed in the polished settle round an aged oak, whereon the "rude forefathers of the hamlet" sat to discuss things of moment to them, than in the Coronation Chair itself.

Folk lore, nature study, and any quaint customs associated with a particular district are welcomed, while the guide who brings to a stop a powerful car exceeding the legal limit in order that the occupants may listen to the liquid music of a lark soaring towards heaven's gates, is conscious of quite a different feeling from that



Four views of a 15.9 h.p. Arrol-Johnston car supplied to Mr. G. Woollven, of Clacton-on-Sea, and provided with the Auster fittings for protection from wind and weather. (1) The front shield and back shield extended, and the hood down. (2) The Automatic hood being raised into position with one hand. (3) The hood up and connected to the front screen, the back screen being folded away. (4) The front shield, back shield, hood, and side curtains all in use.

which the same act would have evoked in the olden time. There is evident a keener desire to enter into the spirit of things.

The belief that a fair knowledge of architecture is a necessity of the modern liberal education is perhaps recognised more by Americans than by ourselves; the erstwhile, to them, vague assertion that so-and-so is Transition Norman or Early English no longer suffices. The distinctive points, order of sequence, period of prevalence and other data are in request, and generalities are not welcomed. Brasses, for example, excite an interest never before exhibited, and the sight of a fair cousin deciphering the Longobardic lettering of a Norman-French inscription, or jotting down the differences exhibited by late and early Camail and Jupon effigies in juxtaposition, is now no novelty.

Subjects may be as wide apart as Warwickshire hedging and a dolichocephalic cranium disinterred from a long tumulus; the rotation of crops and the Bacon-Shakespeare controversy; lychnoscopes and the virtues of Welsh mutton. But undoubtedly practical work in the exhumation of antiquities is the consummation of delight to the visitor from the West. I have seen an American judge, the bearer of a name well-known in all the six continents, delving assiduously in a heap of mould with his walking stick on the remote chance of finding a bone, and witnessed his delight at disclosing a phalanx of a pre-Reformation monk—the earth having been removed from a previous monastic graveyard. Without doubt it now occupies an honoured position in his collection of relics.

A lady with the daintiest of foot gear standing on, or in, a bed of tenacious clay, assiduously extricating flint flakes with a silver pocket knife from the section of a palæolithic floor exposed before her in a chalk

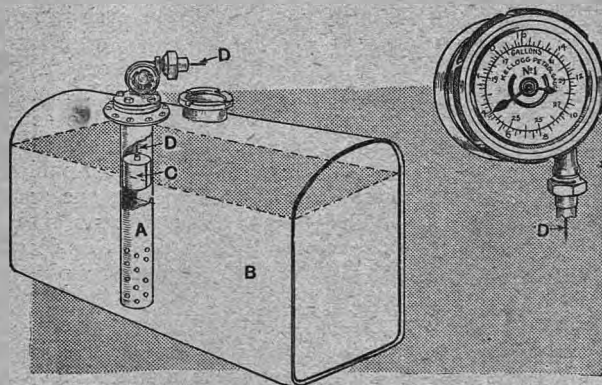
pit, was a sight utterly unknown a decade since, while the delight expressed when two flakes fitted into each other was convincingly real and unfeigned. The expression "I guess that's very old" was formerly applied with equal emphasis to a megalithic circle and a grandfather's clock, and possibly conveyed the same idea of antiquity; it is now almost extinct, and one meets with graduated terms of respect appropriate to the occasion. The English castles were formerly classed as a body; seeing one was considered equivalent to visiting the whole of them; now a dissertation upon the evolution from the motte and bailey type compared with the concentric and other examples is listened to with avidity.

Whether this remarkable change is due to an improved system of education, or to a nascent desire to know as much as possible about everything that presents itself, I am unaware; certain it is that the awakened spirit prevails mostly among the younger visitors, and is more apparent in the gentler sex than in the men. With the determination to do a few things well instead of a number unsatisfactorily will undoubtedly be added a new interest in the old country; for a dip into English rural life, with its ineffable charm of old-world colour, customs, and ideals, of quaint language and modes of expression, will infallibly lead to a desire to become better acquainted with the environment of their remote ancestors who migrated in the *Mayflower*; and the desire to picture them in the mind's eye as they really were, in conjunction with the surroundings with which they were acquainted, will follow upon the satisfaction of genealogical research of which our American cousins have been laudably enamoured for so many years.

The Kellog Petrol Gauge.

THIS is an ingeniously designed recording instrument now being put upon the market by the Kellog Manufacturing Company, 265, Strand, London, W.C. A feature which should make for its popularity is the fact that the indicating dial is set upon the dashboard, and the driver has notification of the petrol consumption and the tank contents right under his eye all the time. It is quite simple in construction and operation, and there is practically nothing to get out of order. It consists of a float column A set in the tank B, as shown in the accompanying sketch. In this column the level of the petrol must

obviously coincide with that in the tank, and within the column is a ribbed float C, to the upper part of which is attached a silk cord D carried through brass piping to the registering dial on the dashboard. Wherever the silk cord has to negotiate an angle it passes over a friction collar enclosed in a dustproof casing. The dial is, of course, marked in gallons and fractions of gallons for British use, and a trial dial for marking up is supplied for tanks of odd dimensions. Dials marked for standard sizes of tanks are stocked. The calibration of the registering mechanism is so arranged that when the small hand is over any portion of the black segment on the left, the black figures beneath the long hand must be read, but when it is over the red segment (on the right) the red figures must be noted. The registering mechanism within the dial, actuated by the rising and falling of the float and the silk cord, is quite simple. The whole apparatus is offered at £8, including fitting to the tank and dial marking.



A petrol tank fitted with the float column of the Kellog petrol gauge. On the right is shown the dashboard indicator, drawn to a large scale.

A, float column B, petrol tank C, float D, silk cord

Referring to the motor car accident which he sustained recently, M. Briand, the ex-Premier of France, is reported to have said that while he was pinned down by the car, suffering great pain in the head and shoulder, he called to his companion, M. Willm, to hurry up and release him. M. Willm's first care, however, was to get out his camera, and then, begging M. Briand to keep steady, he took a photograph of the scene, which he said he considered to be of historic interest.

Small Car Talk. By Runabout.

A Week Down West.

NORTH DEVON contains some of the finest scenery in England, even though it be rather like the schoolboy's cake in that the plums are sandwiched between somewhat indigestible slabs of dough. Early summer is emphatically the best season for visiting Lynmouth, Porlock, and Clovelly, seeing that the heavy tripper coaches have not had time to abrade the roads into the full horror of their August condition. So at Whitsuntide I drove westwards on my five-year-old 12 h.p. Riley to see what the ancient could do in that land of gradients.

My five-year-old was in-great form, and played with Porlock and the scarred stone screeze which masquerades as the road from Lynmouth to Lynton; but owners of less potent hill-climbers may be unaware that it is perfectly possible to "do" this steep nook of coastline with a 6 h.p. Rover badly out of tune. The toll road out of Porlock cannot bring any self-respecting single-cylinder car off second gear, and is infinitely more picturesque than the main road clambering straight over the hill. The latter is rutty in fine weather, and coated with a foot of stodgy red mud after rain.

Two Ways Out of Lynmouth.

There are two fairly easy ways out of Lynmouth. The Countisbury Road begins with 150 yards of deeply scarred 1 in 6; this can be dodged by insouciant persons who play a bluff on the Tors Hotel. This excellent hostelry owns a gentle but unco' twisty private road which starts from the village bridge and ends at its garage on Countisbury Hill. There are no locked gates, and the porter has no truncheon. This road, of course, goes to Porlock. If you wish to get out of Lynmouth to the south without paying 7s. 6d. to the cliff railway, or leaving two tyres in ribbons on the 1 in 4 hairpin of the main road, take the Watersmeet Road out towards Simonsbath: this is a second gear climb even for a single-cylinder car. Turn back on your tracks towards the right at Simonsbath; and you will emerge safely at Blackmore Gate, with a selection of good (for Devon) roads to Ilfracombe, Barnstaple, or elsewhere.

Some Carplings.

The average Devonshire road is a disgrace to any modern community, and I was not surprised to hear that many local motorists disburse as many fees as possible into the exchequers of less archaic authorities. I used to fancy that I had met the great-grandfather of all pot-holes on the Deeside roads in Scotland, but when my car fell into that hole it at least emerged under its own power. In Devon I met several which required considerable outside assistance. On many a Devon highway the pot-holes cannot be bridged by driving with two wheels on the crown and two in the gutter. There are deep pot-holes extending in a solid mass from one edge of the road to the other, with but narrow ribs of frayed original metal between them. When it is wet (and the rainfall is heavy down West) the most courteous driver inevitably squirts red and white liquid over every passer-by. When it is dry (and it is sometimes dry even in the West) he stirs up a deep blinding powder, and in the deep cut, high-hedged lanes it may hang for several minutes after a slow light car with smooth tyres has gone cautiously past.

Some of the residents blame the local railways. They say the train service is so appallingly ante-

diluvian that all the big commercial firms have to employ huge steam tractors with a trail of two or three lumbering waggons. I met many of these appalling behemoths—some of them with steel tyres, a foot in width, with steel laths set diagonally all around the tread; and when I reflected on the Devonshire gradients, the Devonshire rain, and the effect of the rain on Devonshire soil, I did not marvel that the roads were almost uniformly atrocious; and my surprise on failing to find a single decent length of tarred road in those parts of the county through which I passed finally evaporated.

Gloucestershire Signposts.

I was pleasantly impressed when I quitted Devon for Gloucester. Here, at least, the road authorities mean well. They are too sensible to cry "wolf" by putting a red triangle near every gentle curve or easy grade; but when a really perilous corner looms ahead a big board gives you plain warning. Then I fell a-wondering who had persuaded them that white letters on a red arm make a better signpost than black letters on white, for the converse is most decidedly true.

Later on, as I penetrated into rural fastnesses, I met almost every abuse in the way of a signpost that the brain of man could conceive. I found weatherbeaten signposts, of which the lettering had been illegible for centuries; I met signposts off which the local urchins had prised all four arms last Guy Fawkes' Day; and above all, I met many a signpost with broad and lengthy arms, containing the correctly spelt name and distances, accurate to 110 yards, of little villages too insignificant to figure on any half-inch map, which same signposts maintained an impenetrable silence anent the important towns and vital road junctions which form the key of a touring route. So it would appear that even Gloucester flattered only to deceive.

Disaster at Last.

The return journey deserves to be chronicled in that my five-year-old car sustained its first mechanical stop on the road. It was purring up the top knuckle of the long slope leading out of Wotton-under-Edge towards Nailsworth, when the road eased, and I essayed to get back on top gear, but the gear lever clung desperately to the second speed notch. I dismounted, removed a connecting bolt, and proved that the seizure was in the gear box, not in the lever connections. Then I reversed for a mile by gravity and ran the car off the road into a quarry, subsequently to push it out, aided by two friendly pedestrian parsons, with the bonnet towards Wotton. I then started the engine by gravity and ran into Wotton on second speed, reaching Lewton's garage there without a tow. We soon found the cause of the mischief. The firm which I had employed to overhaul the chassis had re-assembled the gear box and closed it without inserting one spot of oil, and the car had done 300 miles with no oil in its gear box save such minute trickles as a drip-feed, intended to replenish minute leaks, could supply it with!

In an hour a smart mechanic had the gear box on the bench. In the next hour he had freed the seized pinion—no easy task in a one-piece aluminium gear box, with very little room for internal access—and remade the bearings; in the third hour he replaced the gear box in position, and we were aboard and on the road again.

Correspondence.

EDITORIAL NOTICES.—No letters from members of the motor industry will be published when they deal with subjects which may be regarded as advertisements for the writers, or their business interests. At the same time as many of the most practical suggestions come from those engaged in the motor industry, their letters will be inserted when possible, though the names of the firms they represent may be expunged, and the initials of the writers substituted.

Letters of a personal nature will be withheld.

The Editor, although accepting no responsibility for the opinions expressed by correspondents, reserves the right to publish a portion of a letter, and to omit any part which he does not consider interesting or essential.

All communications under a *nom de plume* should be accompanied by the name and address of the writer, not necessarily for publication, but to assure the Editor as to good faith.

Enquirers who ask for the experiences of private owners with specified cars, parts, or accessories, are requested to enclose a stamped addressed envelope, so that replies which space will not permit us to publish may be forwarded to them. Circulars or letters from interested parties will not be forwarded.

A UNITED ASSOCIATION OF MOTORISTS.

[19637].—Whether the esteem in which I hold the contributions of "Owen John" is due to my method of reading *The Autocar*, viz., 1st "Queries and Replies," 2nd "Correspondence," 3rd "On the Road," or to their merits, I must leave your contributor himself to decide. He, however, the other week, certainly hit upon an excellent idea.

Writing as a private motorist of some years standing, who now uses a car instead of two or three horses as formerly, I can say that the attractions offered by the existing motoring organisations are not sufficient to induce me to join any of them. The man who first called motoring a "sport" has a lot to answer for, including increased taxation and carefully fostered ill-feeling.

It is time that it was realised that motoring (as distinct from motor racing) is not a sport, but that the average motorist, taking the country as a whole, uses his car for exactly the same purposes for which formerly he used horses, viz., station work, messages to the nearest town, and short journeys, the latter instead of going by the local train.

Where does the "sport" come in? There are several matters which a strong society, such as "Owen John" suggests, might take up; some have been mooted before, but apparently, in only a half-hearted way.

Among them I would include the compulsory lighting, in an effective way, of all vehicles after dark; this including rear lights for cyclists and the lighting of sheep when being moved after dark. In this country (Scotland) sheep, at certain times of the year, are moved for long distances, and a flock filling the whole road is very difficult to see even with good head lights. Then another thing badly needed is a well understood law as to main and side road traffic and a method of marking both classes of roads.

What I have never understood is this. There appears to be a rule, unwritten I suppose, that side road traffic must give way to main road traffic, but there seems to be no law upon the subject, otherwise we should not read of cases where a car on a main road has been held to be in fault because some other vehicle coming fast out of a side road has run into it.

Again, the education of the public is the "first law of nature."

Your correspondent "Ake-Ake" [letter 19522] puts the matter very truly when he says, "He (the motorist) knows full well that it is up to him to look after all the other traffic." The fact is that a too long course of coddling against every imaginable danger has made a great part of our population forget that eyes and ears were given them for self-protection as well as for other purposes. Could anything be more absurd than for a paper to have to publish instructions to its readers as to how to cross a street?

What would happen to some of our population if they got into a country where they really had to look after themselves I shudder to think.

Let me add, in case I should be misunderstood, that I do not expect everything to give way to me, that my driving pace is moderate, and that I have never had an accident, but one may well expect other people to keep awake as one has to oneself.

Lastly, any society which would really resist fresh taxation would earn the gratitude of every

ORDINARY MOTORIST.

[19638].—I think your contributor, Mr. F. H. Hutton [letter No. 19609], gets very near the mark when he asks what good, at the present time, are local and county clubs. There are certain exceptions, and these "live" clubs, in my opinion, are worth supporting, but on the other hand we have plenty of moribund ones in this part of the world (Berkshire). Nothing is being done in the way of promoting hill-climbs, petrol consumption tests, etc., or anything of interest to keen members, and should one wish to enter

for such an event one has to go farther afield and join a club many miles distant. Can one wonder that club interest is waning? What is wanted is an infusion of new blood into some of our local clubs who are content simply to *laissez faire*. This would result in many keen members coming forward, as witness the number of entries in any open event of the "live" clubs to whose officials all honour is due.

EXCELSIOR.

[19639].—I have read the correspondence on this question with much interest, and Mr. Farnsworth's suggestion [letter 19610] seems the only practical one. The attempt to put new wine into old bottles has failed, as anyone could have prophesied.

The R.A.C. dates from the days when motor cars were no more plentiful than race horses. The touring and the utility car alike were unknown. It did the things which were useful in those days, and has, naturally enough, fossilised along those lines. Its present real utility work could be done at about 2s. 6d. per head per annum probably.

The A.A. is in a similar boat. A few motorists formed a self-protection league. They were so few that it cost £2 2s. a head to do things. To-day, with increased membership and a changed police attitude, 5s. per head is probably an outside figure to the actual useful work. Patrols are useful still; but who wants telephone boxes, hair brushes, and such like things? The A.A. has got to spend its money somehow, but heaps of it goes in non-essentials.

There remains the defunct M.U. If my memory serves me right, was not that a new organisation for private motorists? It expired; presumably because it merely duplicated existing organisations.

This I think is a point to consider. I think it is a weak point in Mr. Farnsworth's proposal that his outline is rather too much like the old M.U. one. May I suggest the following:

- (1.) Only some motorists want facilities for foreign touring.
- (2.) Only some require road scouts.
- (3.) Only some (and a very small some) require official "trials."

In fact, there is only one thing which all motorists need in common, and that is the thing which at present is non-existent, viz., a fighting organisation which proceeds along the assumption that motorists have rights just as much as, say, the Waiters' Union, or the Amalgamated Society of Dust Collectors. That could be done for 2s. 6d. per annum per head probably, if it were not considered necessary to have a palatial headquarters on the lines of Solomon's Temple.

Other items would be optional subscriptions, as, for example, R.A.C. foreign touring 2s. 6d. per head, official trials 3d., A.A. Scouts 5s., hair brushes 1d., free legal defence (?), and so forth. Everything could be scheduled at so much per annum.

My figures are, of course, merely approximate and by way of illustration. The matter I wish to see discussed is the principle, i.e., payment of a small sum to cover what we all want, and all luxuries and non-essentials optional. Under some such scheme everyone would be satisfied.

FRED T. JANE (BK 97).

ELECTRIC SELF-STARTERS.

[19640].—I think "Lieutenant-Colonel" [19573] and Dr. Sharpe [19635] misconstrue Mr. Dalrymple Bell's intentions. I do not think he means to decry the electric starter as fitted to the Cadillac cars, but to explain why the general application of the electric starter is hardly at present practicable. It must be remembered that the Cadillac is an American car, and, consequently, differs from English makes in that the engine is probably not so "highly efficient" as it is termed. That is to say, for its engine dimensions it does not develop anything like the power of English engines. Corre-

Correspondence.

spondingly, the power required to start such an engine is probably less than is necessary for most British engines. This probably explains why, in spite of the public demand for self-starters, the electric system has not received much encouragement from English makers.

To judge from the American motor papers, trouble is being experienced with batteries, and it will be remembered that, in America, they have had a far more lengthy experience of starters of all types of engines than anybody or any firm in this country.

The electric system, from what I have seen of it, does not appeal to me. I do not want to carry something between one and two hundredweights and a lot of extra complication to save turning my starting handle. I think most of us want something simpler and cheaper.

OWNER-DRIVER.

[19641.]—Both Dr. Sharpe [19635] and "Lieut.-Colonel" [19573] find fault with my article because in it I pointed out the difficulties encountered in connection with electric self-starters. They quote the satisfactory working of a particular starter on a particular car, and seem to overlook the fact that I was writing generally. If, however, they will take the trouble to investigate, or have explained to them, their starters, they will find that provision is made to meet, if not all, most of the difficulties I have mentioned.

Dr. Sharpe, I think, answers his own question about the general adoption of the electric self-starter when he quotes the Wolseley Co.'s reply to his enquiry.

In connection with my contention that the batteries are working under abnormal conditions, it may be of interest to quote from an editorial in the American *Automobile*, for it must be remembered that in the United States they have had longer and more varied experience of the electric self-starter than we have had:

"It has been stated that practically 95% of electric self-starter troubles are due to the owner's ignorance regarding the care of the battery.

"The practice of giving demonstrations of the power of the starter should be vigorously discouraged by both makers and dealers. It imposes an excessive strain on the starting mechanism, and also impairs the battery."

This editorial is emphasised by being printed in italics throughout.

J. DALRYMPLE BELL.

RUNNING ON BENZOLE.

[19642.]—The enclosed figures may be of interest to your readers as showing the all-round improvement in the running of my car on benzole. The car is a 12-18 h.p. two-cylinder (90°) Riley four-seater, fitted with Zenith carburetter, and standard in every respect.

The trials were carried out on three separate days, over the same route (one way only), six times each the first two and twice only the last test. The petrol tank was emptied before each run with engine running until it stopped, to ensure no spirit being left in pipes, etc., and before the first test of the day the car was run four miles to ensure the same, or approximately the same, temperature.

Spirit.	Gear	Miles	Maintained	
			Changes.	Miles speed per gal. (about).
One quart Shell No. 1	3	7½	30	21-22

A small washer was then added to the float and a Leslie Saunders air inlet fitted.

Spirit.	Gear	Miles	Speed	
			Changes.	Miles per gal. (about).
One quart benzole, 90°	1	9½	38½	21-22
One gallon benzole, 90°	2	—	40½	22-23

The consumption was considered so extraordinary at the first attempts that we repeated the tests several times, as stated, and averaged.

On benzole the starting from cold was immediate; power on hills greatly increased. The only drawback was a rather unpleasant exhaust. There was soot on the sparking plugs until an air device was fitted, which also improved running very considerably; also down hills, with throttle shut and device fully open, we obtained a good brake, and, of course, saved spirit.

I trust these, to me, very satisfactory figures may prove interesting to your readers.

DOUGLAS STUART.

[19643.]—I have been using benzole in my London-Edinburgh Rolls-Royce for approximately 1,500 miles, and think that my experiences may be of interest to some of your readers. I found the car ran well, and the consumption was undoubtedly improved. The starting was more difficult, and a larger jet opening was required to get equally good

results as with petrol. The exhaust was very foul, and it was impossible to run the engine for more than a few seconds in the garage without great discomfort from the fumes.

The one great objection was the effect of the benzole on the carburetter. The sulphur contained in the benzole attacked the brass and copper of the carburetter, forming a thick black deposit, probably consisting of copper sulphide. This action was so serious that all the moving parts became choked up after 1,000 miles running, and necessitated the complete dismantlement of the carburetter to clean it out. The worst deposit seemed to be in the float chamber, from which, after a few hundred miles running, I was able to wipe off a thick layer of sulphide. This trouble was so serious that I have been compelled to return to petrol.

I have not examined the interior of the engine since running on benzole, so I cannot say whether this fuel has produced any bad effects on the valves, etc.

I have also been using benzole in two motor cycles, namely, a Triumph and a Douglas. I have not found the effects of the benzole so marked in these cases, but I have not used it for anything like the same distance as on the Rolls-Royce.

There is no doubt that the use of benzole greatly reduces the liability of an engine to knock. The Triumph, for instance, will knock readily if carelessly driven when using petrol, but on benzole I have been unable to make it knock in spite of deliberate efforts to do so.

I should be interested to hear whether any of your readers have had similar experiences with benzole. I might add that I buy my benzole in fifty gallon drums from a Wolverhampton firm.

C. H. STEPHENSON.

P.S.—The property of benzole in diminishing the liability to knock should be of great value to those whose engines are burdened with an abnormally long stroke.—C.H.S.

PETROL CONSUMPTION ON FORD CARS.

[19644.]—I frequently take accurate records over long distances, and recently, on a run from Brighton to Deal, I consumed an excessive quantity, viz., a fraction over 18 m.p.g. The fault was due to the partial closing of the shutter of the air inlet. On the return journey the record was 23½ m.p.g. The car in question is fitted with a heavy coupe body, and weighs 15½ cwt. Last month a tour of over 1,000 miles gave 36½ m.p.g.; this on a five-seated touring Ford with modele de luxe body.

The most likely cause for excessive consumption is the undue opening of the petrol inlet, which is controlled from the dash; a quarter turn of this will make a most pronounced difference. My advice is, put a mark on this so that its position can be seen at a glance. Broadly speaking, this control should be open half to five-eighths of a turn, but for starting and slow running another quarter turn should be made. I should like to hear your correspondent's experience after following my advice.

MOORE OF BRIGHTON.

PERPETUAL MOTION (?).

[19645.]—Mr. Perrott's last letter [No. 19628] seems to require a short reply on my part.

My previous figures are easily amended for the reduced period of activity, and remain colossal.

The "principle of leverage" in connection with the 2½ h.p. rewinding spring has a distinct flavour of perpetual motion, and, since leverage does not increase energy, this spring must be continually re-wound or capable of working for a very long period. It is itself, I suppose, wound on a similar principle by a less powerful spring, and so on *ad infinitum*, until the prime mover is finally reached, and from which a greatly augmented output would be necessary!

For those having time to waste, such principles are no doubt better discussed at the offices of Sandor's Motive Power Syndicate, Ltd., than in your columns. Can the actual 18 h.p. springs be inspected and tested?

CHARLES H. HOLE.

THE SPEEDOMETER DRIVE.

[19646.]—On reading the remarks in *The Autocar* of May 31st on the provision by car manufacturers of some suitable means of driving the speedometer, it occurred to us that a few remarks on the subject, from the point of view of the speedometer manufacturer, might be of interest to your readers, as, in order to obtain the most effective and economical transmission, the co-operation of the car manufacturers and speedometer manufacturers is essential.

To deal first with the forms of speedometer drive fitted to cars where no special provision is made for driving the speedometer. The drive by flat belt from the cardan-shaft

is quite efficient, and, with well-made bearings for the driven pulley, will last as long as the car.

The drive from the front wheel is also efficient, but the exposed gears are, of course, liable to wear, although the distances for which these gears will run are very much greater than "L.A.L." appears to think.

The difficulty in applying a speedometer drive satisfactorily arises when the car designer, having enclosed the cardan-shaft, makes a steering arm of such a shape that a bracket for carrying the speedometer drive cannot be securely clamped to it.

The front wheel drive is not, however, the ideal drive, and a much more satisfactory drive can be made if the fact that the car will almost certainly be fitted with a speedometer be taken into account by the designer.

This has been realised by some of the leading makers who provide sufficient means of driving the speedometer.

When a speedometer is fitted by the car manufacturer as part of the standard equipment of the car, it is possible to incorporate a speedometer drive in the gear box as suggested by your correspondent, but in the case of cars to which it is desired to fit any make of speedometer, the provision on the universal joint cover of a pulley for a flat belt is a very simple and effective method of overcoming the difficulty without adding to the cost of production.

The method followed by a few designers of providing a V-pulley, or a pulley for a round belt on the universal joint cover, does not constitute a satisfactory provision for driving a speedometer.

The object is not to transmit great power, but to transmit such power as is required smoothly and uniformly, and this is effected much more satisfactorily by means of a pliable flat belt than with either the stiffer round leather belt or the spring belt.

We have a number of devices for overcoming the difficulties found in fitting speedometers on some cars, but these necessarily increase the cost and would be unnecessary if suitable means of driving the speedometer were provided by the car manufacturers.

NICOLE, NIELSEN AND CO., LTD.
(Watford Speedometers).

[19547].—Our attention has been drawn to the remarks by "L.A.L." in your issue of May 31st on the speedometer drive. Will you allow us to second all that your contributor writes on this question of speedometer drive, and may we also support his recommendation of drive from the gear box as being the best of the various methods of drive so far adopted. If car manufacturers would provide some simple arrangement in the way of a counter-shaft from their gear box for speedometer drive, it would simplify matters very much from the speedometer maker's point of view, and would most decidedly be more satisfactory from the car manufacturer's standpoint also, to say nothing of the eventual car owner. A simple arrangement of this kind would obviate the necessity of removing car wheels for the fitting of gears, the tapping and screwing of hub flanges, and other interference with the chassis, which ought certainly to appeal to the car manufacturer. From all points of view we consider that an arrangement of this kind would be an assured success.

We suppose it is asking too much that the different manufacturers could institute some standard size for the proposed counter-shaft, say 1 in. or $\frac{3}{4}$ in., and the ratio of the counter-shaft for the speedometer should be anything from $3\frac{1}{2}$ to $4\frac{1}{2}$ to 1, we suggest, to the back road wheel; the counter-shaft should project about $1\frac{1}{2}$ in.

MARKT AND CO. (LONDON), LTD.
(The Jones Speedometer).

THE LUBRICATION OF WORM GEAR BACK AXLES.

[19648].—I have noted with interest your remarks under "Useful Hints and Tips" on the lubrication of worm gear back axles in your issue of May 31st.

So far as the back axle is concerned, I have no comment to make, but I cannot help raising the point that the remarks you introduce relative to the lubrication of gear boxes are somewhat irrelevant. You assert that Mr. Lanchester's tests show that a mineral oil ought not to be used in the gear box. Personally, I cannot see what induces you to make this statement, because Mr. Lanchester's remarks, as I understand them, applied only to the back axle in general, and the worm-driven type in particular. Further, the idea of allowing leakage to come into the question at all when deciding on a suitable lubricant seems to me anything but desirable, because I claim that it is perfectly possible to make both a gear box

and back axle so nearly oil-tight that for all practical purposes they may be regarded as being oil-tight. Now I consider it an immense advantage to a customer to be able to use the same oil for engine, gear box, and back axle, and although, admittedly, a slightly different lubricant in each of these three specific components might advantageously influence the efficiency of either in a small degree, yet I maintain the practical increase of efficiency is so small as to be ignorable by comparison with the many advantages of being able to use the same oil throughout. The oil supplied to customers of Crossley cars is a mineral oil combined with a certain proportion of castor oil, and my experience is that it is all that can be desired in any of the three components. The decision to use this was arrived at after many months' tests, including hill-climbing competitions and the ordinary routine to which a car is subjected.

I note in the article in question that you state that some makers' instruction books actually warn customers not to use engine oil in their gear boxes. Crossley practice is directly opposed to this, as illustrated above. So far as oil leaks are concerned, the present model Crossley cars rely on properly designed oil throwers in preference to glands to prevent leakage, together with suitable means to allow free expansion of the air inside the gear box or back axle to take place, and thus prevent the lubricant being forced out under internal pressure.

I note with pleasure your remarks in reference to the proper arrangement of oil level indicator for both gear boxes and back axles. This has appealed to me so particularly that it has been embodied in Crossley cars for the last twelve months.

A. W. REEVES.

LONG V. SHORT STROKE ENGINES.

[19549].—No letters on this subject have referred to the indicator diagrams obtainable from long and short stroke engines of the same bore. I would, therefore, ask if there is any insuperable difficulty in taking diagrams from high speed engines, and whether I am wrong in thinking that indicator diagrams have been taken by using a ray of light projected on to a photographic film, instead of the usual pencil method? Suitable indicator diagrams would determine positively how the mean effective pressure is affected by lengthening the stroke, and how long the useful expansion of the charge continues.

H. RICHARD.

DAMAGE BY ROAD TARRING.

[19650].—Amongst the little things that matter whilst going a-motoring at the present time is the question of road tarring and damage to motor cars. In this district (Harrogate) the tar is being put down right across the road, and consequently cannot be avoided, as motorists know to their cost. It would seem to the lay lawyer that damages could be claimed from the authority responsible, or at any rate the risk curtailed by influencing the work being done on one side of the road at a time. This is one of the questions which one expects our motor clubs—the R.A.C. and A.A.—to take up. Have they done so? A test action would quickly remedy matters or afford some mitigation. As things go, the trouble is getting serious.

C 1634.

THE AGE OF SECOND-HAND CARS.

[19651].—For three or four weeks I have studied the list of second-hand cars advertised in *The Autocar*, and wonder why so few would-be sellers put the year of the model for the information of prospective buyers. Are they, I wonder, ashamed of the age of their cars? I was on the look-out for a second-hand car, and find such amazing differences in price that I did not know where to begin in answering. In your issue of June 7th, for instance, under one well-known make of car, I see two cars of the same horse-power, and both fitted with landaulet bodies. In neither case is the age of the car given; one is priced at £125, the other at £350. I am sure if the age was stated advertisers would have more genuine replies, and purchasers would be able to save much time and bother.

PERPLEXED.

THE INDIANAPOLIS RACE TRACK.

[19652].—I note an error in your description of the Indianapolis Motor Speedway in your issue of May 10th (page 839) which also appears in the official literature. The turns are of only 840ft. radius, instead of 1,500ft. There are two straights, on the east and west sides, of exactly five-eighths of a mile each, one short straight on each end of exactly one-eighth of a mile each, and each turn is absolutely circular and a quarter of a mile each (i.e.: the

Correspondence.

four turns put together would make a mile absolutely circular track).

The track is 60ft. wide, the turns are banked 15ft., and the maximum banking is 34%, this being at 890ft. radius. A little calculation will show that this is banked for only seventy miles per hour—a fearful oversight.

As to why they advertise 1,500ft. radius I do not know. Doubtless just "boneheadedness," like the original poor banking was, although at times one feels inclined to believe it was to induce the foreign entrants to believe the track faster than it really is.

Indianapolis, U.S.A.

ALEX. L. SHERIDAN.

A WARNING.

[19653.]—I must take exception to the letter [19636] signed by Mr. W. Basil Jones in *The Autocar* of June 7th. It is very rare for a week to pass without two or three motor accidents in Eastbourne. These generally happen to strangers unacquainted with the peculiarly dangerous nature of the roads. The streets run at right angles to one another, while the system of planting trees greatly increases the danger and makes it difficult for the drivers of motors to see one another when coming to cross roads. At least seven members of the Bench are motorists, and it is rare for any sitting to take place without a motorist being on it. If motorists will only drive with consideration for the other users of the road, they need have no fear of police prosecutions in Eastbourne.

MEMBER R.A.C.

A SPEED-JUDGING CHALLENGE.

[19654.]—I enclose a cutting out of this week's *Surrey Comet* describing my conviction for furious driving. Although Colonel Turner's name was mentioned, this gentleman was not in attendance. The prosecutor having described himself as a public man, I issue a challenge to him for a speed-judging competition for the sum of £50 (fifty pounds), thereby giving him an opportunity of assisting some public charity which he may be interested in.

R. W. GRAFF.

[The case was heard before the Kingston County Bench, and the charge was supported by the evidence of Mr. W. E. Ainsworth, a member of the Surbiton District Council, who swore that the speed of the car was thirty miles an hour, and by that of a police constable, who corroborated. Colonel Turner was mentioned as having also complained. Mr. Graff himself swore that his speed was well within twenty miles an hour, and that as the car was a new one, being tried at the time by the wife of an intending purchaser, he was specially instructed not to drive fast. The magistrates inflicted a fine of £2 and costs.—ED.]

FRENCH ROADS.

[19655.]—There is a rather significant story told of Gladstone, who received on some occasion a special envoy from Japan. After a long interview the Japanese emerged enchanted and amazed at the English statesman's marvellous knowledge. "He knows all about absolutely everything," he exclaimed, "except Japan. He talked much about our country, but knew little about it, which seems singular."

I am frequently reminded of this little tale as I read "Owen's John's" omniscient musings on every subject under the sun, for whenever he touches any topic on which I may happen to know rather more than the man in the street—on whose ignorance the omniscient journalist presumes—I invariably find him at fault. Take, for instance, his remarks about French roads in your issue of May 24th. He may know about everything else but his omniscience stops short of this particular subject. Which "gives to think," as he himself would say.

I have been living in France for the last six years, and during that time have covered some 40,000 miles of roads of every kind and in every direction, and as the result of this considerable experience (which may perhaps be worth even more than "Owen John's" vaunted twelve trips across France) may state that during those years the main roads have, without exception, steadily deteriorated, and at the present moment many of the Routes Nationales are, over long stretches, nothing better than the vilest of pot-holey, rutty tracks, and a blot on the once merited reputation of French highways. To take one instance out of hundreds, the main road from Lyons to Grenoble (R.N. No. 6) has for months past been so villainously bad that for miles together it has been impossible to travel at over 12 m.p.h. without running the risk of breaking one's springs and loosening every bolt in the chassis. Its surface strongly resembles that of the main London-Holyhead Road, as depicted a few pages further on in the same number of your paper.

We know quite a lot about "Owen John's" trips to France. I have distinct recollections of his "lordly Talbot" (why "lordly"? Has it a reference to the noble chairman of the company, or the coronet that graces the radiator?) snoring—or was it snorting?—up some pass in the Pyrenees, and subsequent jaunts in his Zedel. But has he ever motored round Lyons, or Grenoble, or in Auvergne, or Touraine, or in the North, not to speak of the unspeakable Alpes Maritimes? I can scarcely imagine that he can have been of late years to any of these districts—which I merely select as instance—for if so he could not write as he does about French Routes Nationales.

And has "Owen John" never heard of the monster petition to Government got up last year by the Touring Club de France calling attention to the deplorable state into which the main roads of the country had been allowed to fall, and urging, in the interests of France as a touring ground for motorists, that this crying question of the roads should be taken in hand without delay? Does he think that such a movement could have been set on foot unless there had been some grave reason for alarm?

No. Whatever French Routes Nationales may once have been they can no longer be held up as models of what highways should be to other countries. This unhappy state of things is due to two causes. Firstly, the enormous increase in the wear and tear, about 90% of which must be laid to the charge of the huge motor charrs-a-bancs, lorries, and covered vans which ply on nearly every road of importance; and secondly, the present cheese-paring methods of maintenance, under which a road is not taken in hand until it is so bad as to be almost impassable, and is then re-made in lightning quick time with the thinnest imaginable layer of metalting, frequently of the worst and cheapest kind, hastily ground in with a steam-roller, floods of water, and a plentiful supply of mud. I have seen roads re-made in this way going to pieces again within a fortnight, the stones becoming loose and getting kicked out by every passing hoof. Until some change is made in these methods, there seems little hope that the French main roads will ever regain the beautiful surfaces they once could boast of.

The best roads in France, according to my experience, are the Chemins de Grande Communication, Chemins d'Interêt Commun, and other secondary and minor roads, many of which are still admirably kept up, especially in the mountainous districts of the Cévennes and Dauphiné Alps. Nearly all the roads that are marked in white on the Taride Maps in these regions, and a great many of those that are indicated by a single black line such as would make the stranger pause before he embarked on them, leave nothing to be desired in the way of surface. And their grading is such as one would expect in France, whose road engineers have always been unsurpassed.

ROCHET.

THE R.A. COON.

[19656.]—

They are slinging ink and ire,
Quite a lot,
O'er a certain famous tyre
(Name it not!)
Though we thought—for quite a day!—
Peace had come, it did not stay,
And some captious critics say
'Twas a plot!

For a Club of some repute
(No! no name!)
Quoth: "I'm climbing down, don't shoot!"
And it came!
But it seems 'twas just its fun,
Gaily meant to cheat the gun,
'Twas a trick, though neatly done
All the same!

But the gunner, Mr. Yar—
(Cut it out!)
Can shoot running game from far,
Not a doubt!
And that coon too cute may find
Fate and marksman both unkind—
'Twill get pepper, then, behind,
Just about.

R.K.M.

TYRE MILFAGE.

[19657.]—Perhaps the following may be interesting as an instance of tyre wear. The tyres were all 815 x 105 Dunlop, two plain, two grooved, one steel-studded purchased with the

car (a 12-16 h.p. Wolseley 1912 two-seater, weight 21 or 22 cwt.) in April last year. I have toured considerably in the Midlands, about 1,000 miles in Kent and Surrey, and 1,000 miles in Yorkshire, the roads here being the worst perhaps I have encountered.

The wheels are Rudge-Whitworth detachable, and I attribute a good deal of the wearing qualities of the tyres to the fact that they are light on tyres and that one can so readily change the wheels from side to side. I quite know that many tyres do a greater mileage, but the consistency of the four wheels is perhaps the interesting point.

Plain: 3,950 miles on "off" front; 4,050 miles on "near" front; still running.

Plain: 3,900 miles on "near" front; 4,050 miles on "off" front; now carried as spare.

Grooved: 3,000 miles on "off" driver; 600 on "near" driver; still running.

Grooved: 7,100 miles on "near" driver; retreaded for further use.

Steel-studded: 6,000 miles on "off" driver; still running. 8,000 miles per wheel, and not a single puncture!

W. S. PLAYER.

P.S.—The total cost of the five tyres, including inner tubes, was £35 9s. 8d.; the cost should work out at the finish at about 2d. per mile.

MOTORING IN THE MALAY STATES.

[19658].—Referring to letter 19629 by "A Regular Reader," his facts are erroneous, and likely to mislead your readers.

1. The bridge is under thirty miles from Ipoh, instead of forty as stated.

2. There is nothing to cause excitement, as the bridge is very simple to negotiate, and any decent car brakes would hold on the approach gradients.

3. There are no crocodiles in that part of the river, except the small freshwater species, which seldom attack mankind.

4. There is no "drop" of many inches passing from one pontoon to the other, but the floating ones naturally swing to the rolling weight passing one to the other.

I would mention that the bridge in question is not a serious obstacle to negotiate, as you will understand when I tell you that in March last I travelled from Taipei to Ipoh (fifty-five miles) in under two hours, the bridge being in the centre of this section of F.M.S. roads.

E. T. C. GARLAND.

THE ROAD OVER THE DEVIL'S ELBOW.

[19659].—I shall be glad if you will warn fellow motorists to avoid the road over the Devil's Elbow to Braemar, as it is in a disgraceful and ruinous condition. One expects to find it rough at the summit, but it is now far worse than usual. Two or three miles north of the summit towards Braemar, the road is being repaired in a very thorough manner, and will ultimately be very good, but in its present condition it is dangerous, and simply cruel on tyres. Solid foundations are being laid of rocks about half the size of a man's head, and quite half a mile of these remain uncovered, although partly rolled. I had more than once to get out of my car in order to see if the flywheel would clear the rocks, and it is exasperating to realise that all this could be avoided if the authorities gave instructions that the foundations be covered up when laid and a passage for traffic left at one side alternatively during the making. This half-mile of unfinished road is the worst I have ever met during a long experience of motoring in this country and on the Continent.

P. J. ATWOOD BEAVER.

THE MOTOR PETROL ASSOCIATION, LTD.

[19660].—As an advertisement of this Association appeared in your issue of the 31st ult., I trust you will permit me to draw the attention of your numerous readers to the articles in *Truth* of the 2nd and 23rd April and the 4th inst. regarding this Association.

1912 VAUXHALL.

A NEW "NUT."

[19661].—Unless your commercial colleagues have hit upon a new and most specious form of advertising, I have discovered a new and most interesting variety of "nut" in that most unlikely of all places—the Piccadilly tube!

This young man has ridden from Earl's Court to Dover Street every morning for a week carrying a speedometer—motor bicycle size, with the cable trailing sword like at his side—and an equally service scarred copy of *The Autocar* with the front title-page most boldly displayed.

Correspondence.

To see him juggling with speedometer, a silver-headed malacca cane, a long ivory cigarette tube, and gloves, not to mention his train ticket, is to realise that every one of Nature's creatures has some merit. Unless, as I say, this youth is engaged by your publisher to advertise the best of motoring weeklies. I am practically sure that our young friend's intention is to let all the tube-using world see that he is a motorist. What?

Others of your readers may have seen this young gentleman I have tried to describe. If so, I hope they will write and give you their impressions of the existence of any method in his—er, form of amusing himself.

OBSERVANT.

SOME MORE POINTS FOR NEXT YEAR'S CARS.

[19562].—While entirely agreeing with the points mentioned in your Notes of June 7th, I cannot resist mentioning that, with the exception of a fixed pulley wheel on cam-dan-shaft to drive dynamo and speedometer, my Siddeley-Deasy of 1911 possesses all the refinements enumerated.

The jack tables on back axle are all that could be desired, and as recently as Derby Day proved their usefulness. Returning in the crowd, a 3in. nail punctured the off side back tyre, and had it not been possible to effect a quick change a serious block of traffic would have occurred.

The oil filler to the worm drive is exactly as you specify, and the car is a 1911 model.

T. B. PERCY.

REPAIRS.

[19663].—With reference to "H.C.'s" experience [letter No. 19541], I think there are few owners who have seen an account made out in the manner he describes. In my nine years' experience there is no mention of a labourer or a man at 5½d. per hour, as anyone capable of undoing a mudguard is charged for at a mechanic's rate of pay. Here is an account lately presented for putting one bush in a 15 h.p. gear box:

Taking down gear box, cleaning and facing		
brake shoes, and fitting pins (eighteen		
hours at 1s. 6d.)	...	£1 7 0
Phosphor bronze, 3 lbs.	...	0 4 6
Boring, turning, and fitting	...	0 5 6
Turning up shaft and grinding same,		
fitting up and assembling gear box		
(twelve hours at 1s. 6d.)	...	0 18 0
Total	...	£2 15 0

This is about the general way an account is rendered.
A.B.C.

BOOKS and MAPS
FOR MOTORISTS

	Price.	
	Net.	Liy post.
"Complete Hints and Tips for Automobilists"	2/6	2/10
"Faults and How to Find Them." J. S. Bickford, B.A., 3rd edition	2/6	2/10
"The Maintenance of Motor Cars." Eric W. Walford	2/6	2/6
"Encyclopedia of Motoring." R. J. Mecredy	7/6	7/10
"The Autocar" Log Book	1/6	1/8
"Motors and Motor-ing." Prot. Spooner	2/-	2/4
"The Highways and Byways of England"; Their History and Romance T. W. Wilkinson	4/6	4/9
"The Autocar" Sectional Map of England and Wales. Consisting of 24 loose sections on strong card. Scale 3 miles to the inch		
In stout waterproof envelope	4/6	4/10
In cloth case	6/-	6/4
In solid hide case, celluloid front	12/6	12/10
"The Autocar" Map of England and Wales. Scale 3 miles to the inch		
Dissected and folded, in neat case cloth	8/6	8/11
Also on rollers (a good wall map)	8/6	8/11
"The Autocar" Map of Scotland.		
"The Autocar" Map of Ireland. Scale 7 miles to the inch.		
	Same styles and prices as above.	
"The Autocar" Map of London and Environs.		
In stout waterproof envelope	3/6	3/10
In cloth case	4/6	4/10
Solid hide case, celluloid front	12/6	12/10

Obtainable by post (remittance with order) from
ILIFFE & SONS Ltd., 20, Tudor St., London, E.C.
or of leading Booksellers and Railway Bookstalls.

Flashes.

Prince Henry of Prussia was last week the recipient of many congratulatory messages and presents from motoring associations at home and abroad on the occasion of the celebration of his silver wedding.

* * *

A leaflet entitled "Notes upon Tar Treatment of Road Surfaces," giving the elementary principles in road tarring work, has been issued by the Roads Improvement Association, specially prepared for the information and guidance of men actually engaged in tarring work on the road. The unsatisfactory results from the tar treatment of roads often complained of by road users have been traced, in many cases, to be due to the non-observance of the elementary principles underlying this work. The leaflet deals with: (1) The suitability of a road for tar treatment, (2) the preparation of the surface, (3) the type of tar to be used, and (4) the application of tar to the road and its subsequent gritting. There are also notes upon the removal of tar splashes from clothing, paint work, animals, etc. The Secretary to the R.I.A. (Mr. Wallace E. Riche, 15, Dartmouth Street, Westminster, S.W.) will supply copies at 2d. each.

* * *

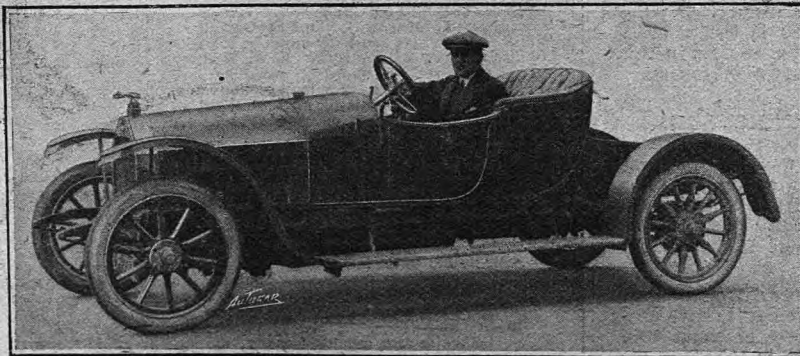
The work of widening a portion of the road leading from Bexhill to St. Leonards, which will form the first section of the proposed coast road from Eastbourne to St. Leonards, is shortly to be commenced.

* * *

The local council of Clacton-on-Sea has rejected a proposal of the Highways Committee for a ten-mile speed limit in the vicinity of the town, and the Automobile Association has agreed to erect caution notices.

* * *

The Roads Improvement Association has forwarded to the Corporation of Ealing a petition signed by the majority of the traders *en route*, urging their acceptance of the offer of the London United Electric Tramways Co., Ltd., to remove the whole of the existing standards from the centre to the side of the carriage-way in the Uxbridge Road, between Culmington Road and Eccleston Road.

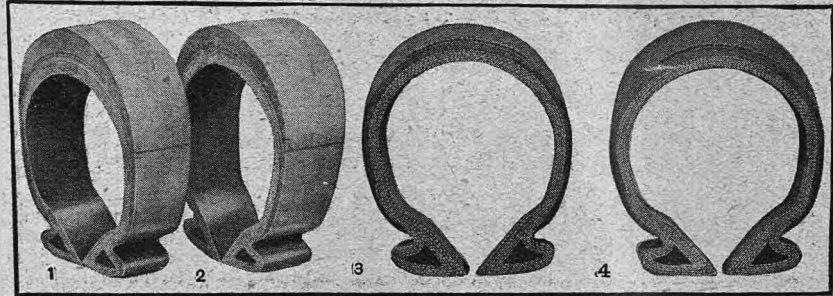


The 12-15 h.p. D.F.P. car which, with Mr. W. O. Bentley at the wheel, won first place in Class 2 at the Aston Hill-climb of May 24th. For two years in succession, by being first on formula and also making the fastest time in its class, the D.F.P. car has achieved a meritorious performance

Mr. Mervyn O'Gorman, superintendent of the Royal Aircraft Factory, was included in the Royal Birthday Honours last week, he being created a C.B.

* * *

In order to warn motorists of the existence of a ten-mile speed limit on Putney Bridge, and in High Street, Putney, the Wandsworth Borough Council has agreed to have a 12in. red band painted on the lamp-posts.



Sections of four Sirdar tyres, showing the additional thickness of rubber which is now being fitted to the tread in the later patterns, this extra rubber amounting to 25 per cent. The left-hand pair show sections of grooved tyres, No. 1 being the new type cover with the extra rubber, and No. 2 the type supplied until recently. The right-hand pair are plain tread covers. In this case it is obvious that the tyre with the extra rubber is that numbered 4. The prices of Sirdar tyres have not been increased, for the favourable condition of the raw rubber market has enabled the makers to add the extra thickness of rubber without additional cost to purchasers.

The Automobile Club de la Sarthe of Clermont-Ferrand is offering for competition among hotel proprietors a prize of £40 for good cooking.

* * *

Those motorists contemplating a tour in Switzerland and the Tyrol may be interested to learn that the roads over the Arlberg (Tyrol) and the Falzarego and Pordoijoet Passes in the Dolomites are now open for motor traffic.

* * *

With respect to the complaints concerning the condition of certain of the roads in Carnarvonshire, North Wales, we understand that the Pwllheli Town Council has instructed its surveyor to carry out the necessary improvements without delay.

* * *

We are informed that a number of seats on the grand stand have been reserved by the Automobile Club of France for Members and Associates of the Royal Automobile Club who propose visiting France for the Grand Prix Race on July 12th and 13th. Members and Associates wishing to book seats on the stand are recommended to apply immediately to the Secretary of the R.A.C.

* * *

Last week we announced that Mr. H. R. Pope had been chosen as one of the three drivers for the three Itala rotary-valve cars in the Grand Prix race. Previously we had announced that Nazzaro was driving one; the third driver is Moriando. We think it a great honour to Britain and to Mr. Pope that he should have been selected as one of such a trio. Anyway, all three men are not only brilliant but they are finishers, and if they can get through they undoubtedly will

Some Queries and Replies.

Readers seeking the experience of users of specified cars, parts, or accessories are invited to insert their queries in these columns, and their fellow readers are invited to reply.

Querists are asked to enclose a stamped addressed envelope, so that replies may be made direct if the subject is not considered of sufficient general interest to publish.

Letters should be addressed to the Editor, "The Autocar," Hertford Street, Coventry, and replies to queries should bear the number of the query to which they refer.

Editorial advice is at all times willingly given to our readers.

REPLIES.

No. 2694.—Removing Tar Stains.

I had my grey car spotted like a leopard. I warmed some linseed oil, put it over all the tar, allowed it to remain a few minutes, then used a mutton cloth with petrol, rubbing hard; and all the tar came off. I polished the body after with one part turpentine and three parts linseed oil.—E.B.M.

No. 2702.—Light Two-seaters.

I have had no experience of the cars named, but should like to testify as to the excellence of the 10 h.p. Turner. I have driven one for nearly 7,000 miles since last November and have nothing but praise. I can easily keep up 20-25 m.p.h. on ordinary roads, and the car averages 33 m.p.g. and can do up to 40 m.p.h. I use the car for business principally, and have never been held up, and the tyres on the driving wheels have done 6,000 miles, and look equal to another 6,000 miles. One is a Palmer cord and the other a Skew. The car has a very roomy body and I can seat three if necessary. I have no interest in Turner cars except that of an extremely satisfied user, and as I am out in all weathers and go as far north as Scotland, the car has had a very severe testing.—K 5877.

I have run a Turner 10 h.p. (8.9 h.p. R.A.C.) some 3,800 miles in North Wales, the greater part of the distance being over the rough Merioneth roads and cart tracks. I must say that the car has proved fast, reliable, and economical. I would wish the track wider, and the car heavier and a little higher powered. It would then, I think, meet the conditions of the ruts, pot-holes, and short sharp gradients that this country abounds with. I admit that the conditions here are exceptionally bad. Given a less hilly country and better roads, the Turner 10 h.p. would give "X.Y.Z." the light car he is looking for. Usual disclaimer.—MERIONETH.

No. 2711.—Taunton to Exeter and Launceston.

I drove over this road recently, and found it quite good except for about ten miles between Exeter and Okehampton. From about three miles beyond Exeter it has been badly damaged by traction engines, and is very bumpy and wavy, but if speed is reduced to about 12 m.p.h. the road can be traversed without any likelihood of damage to the car. The surface is fair, but it is transversely corrugated, and pot-holes abound. The rest of the way is good, but road mending is going on at Red Ball Hill, near the Devon border. The road by Moretonhampstead, Two Bridges, Tavistock, Callington, Liskeard, and Bodmin has good surface throughout, but is very hilly.—S.W.T.

The Okehampton road is still very bad, but one can go from Exeter to Crediton, Bow, on the North Tawton Road, not going right into the town, and continuing on the Hatherleigh Road

until reaching a left-hand turning to Okehampton, which takes one into Okehampton and thence to Launceston. Or one can take a very pretty road, a little hilly, but well worth the trouble, and very little further, by going from Exeter to Moretonhampstead, Two Bridges, across Dartmoor, to Tavistock, and then on to Launceston. On a fine day this is a beautiful drive, but one needs to drive with care, as at the bottom of some of the hills will be found a small bridge, and, if one is going fast, the car will jump, and sometimes there is a sharp turning at the bottom. There is a nasty corner on the ascent just before reaching Moretonhampstead; it is a right-hand turning. Two Bridges is a good place for a meal.—W.J.S.

No. 2701.—Benzole on Bedford Car.

I have used benzole on my 15-18 h.p. (1911) Bedford car for about four months with excellent results. The mileage is increased from 23 to 25 miles per gallon. While the car is in motion the running is sweeter and more even, but at the standstill the engine will not throttle down as low as when petrol is used. The only alteration necessary to the Bedford carburetter was a slight adjustment of the air, as benzole is a heavier spirit than petrol. The pulling powers are roughly the same, but there is a slight loss of flexibility. The plugs are apt to foul rather quickly, but this is only soot and is easily removed. Experts are inclined to disagree with the use of benzole on the grounds that it affects the metal of the pistons, etc. I cannot give any opinion on this point, as I have not used benzole long enough to find any result of this.—W.F. Str. C.

No. 2687.—23 h.p. Six cylinder Star.

I purchased last August, through the local agent, a 23 h.p. six cylinder Star car, fitted with landaulet body. Since purchase the car has travelled about 3,500 miles, and no trouble or involuntary stoppage has been experienced. The flexibility of the engine is splendid, and there is ample reserve of power. Petrol consumption is 17 to 18 miles per gallon. The car is light on tyres, and is still running on the original Dunlop tyres, which include steel stud covers on back wheels. I have toured Bristol district, Clifton Downs, and Cheddar Cliffs without any difficulty on the hills, and can with confidence recommend the car as very suitable for hilly districts.—A SATISFIED PURCHASER.

No. 2693.—Kettle Boiling by Electricity.

If "I.S.W." has a 12 volt installation for lighting his car, he will be able to boil a kettle from this supply; if he is running on a less voltage, I am afraid it will be useless his trying it. Firms such as the General Electric Co. or Verity's would supply a kettle on being told the voltage and the time allowed for boiling the water. This latter is very important. For instance, to bring one pint of water from a temperature of 60° Fahr. to 212° Fahr. in four minutes will take 1,000 watts, that is a current of

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September, 1911, 12-16 h.p. Wolseley,
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complete £265.

Late 1910, delivered 1911, 12-14 h.p.

F.I.A.T. open touring car, complete
with C.A.V. outfit 2 screens, detach-
able rims. Everything necessary
.. .. £240.

1909-14-18 h.p. S.C.A.T., Mulliner double
phaeton body, hood, screen, speedo-
meter. In excellent order .. £150.

1912 15 h.p. S.C.A.T. 2-seater, beauti-
fully equipped £325.

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C.A.V. electric light outfit, Klaxon
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Some Queries and Replies (Continued).

83 ampères at 12 volts; a rate of discharge far beyond the range of an ordinary C.A.V. lighting battery, being probably seven times what all lamps on at once will take; so at least sixteen minutes must be allowed. This will call for 250 watts, i.e., 21 ampères at 12 volts, which will be even then a somewhat high rate of discharge, but the cells, ought to stand it now and again. The current had better be taken direct from the battery through two special leads to a push plug wired in some convenient place, say the dashboard; the firm supplying the kettle had better supply the necessary flexible wire and plug; they can then be depended on to carry the high current. It will save a lot of current if the water put into the kettle be already hot, i.e., carried in a Thermos flask.—F. BASS SUTTON.

No. 2696.—Dodson Valveless Car.

I purchased last summer a second-hand 15 h.p. Dodson Valveless car and have had great satisfaction with it. Fuel consumption about eighteen miles to the gallon, using Taxibus spirit. The car runs quietly and is well sprung and easy on tyres. If "Hillside" cares to write to me I shall be pleased to give him any information in my power.—CHARLES SMITH.

No. 2695.—Removing Carbon from Cylinders.

I can testify that cylinders cleaned by the Cylclean process, with the firm's instructions carried out and done by a mechanic, will result in a most clean job. With the aid of this process and two small home-made scrapers a mechanic can get every portion of carbon off the piston tops, cylinder heads, top of the valves, and every small corner of the valve box, on any make of car. Being a practical motor engineer, and having used this process, I prefer it to dismantling an engine, as one has only to break the valve cap joints for it to be used.—A. H. HAZEL-DENE.

Catalogues and Booklets Received.

Windhoff cars, which are manufactured by Windhoff Bros., Rheine, Germany, and bear an excellent reputation in that country, are now represented at 8 and 9, Sherwood Street, Piccadilly Circus, London, W. A descriptive catalogue will be sent to any of our readers on application. The cars are turned out in six types, from 10-12 h.p. to 30-40 h.p., and range in price with four-seated bodies from £290 to £675.

One of the most interesting booklets we have received of late is now being issued by Vauxhall Motors, Ltd., entitled "The Sporting Car." This deals essentially with the Prince Henry type of chassis, and in particular with the 1913 model, having four cylinders of 95 x 140 mm. In the booklet in question, the various performances of the high efficiency of Vauxhall cars are dealt with, and the advantages of the sporting type of car with two and four-seated bodies are set forth. The booklet is profusely illustrated with actual photographs pasted on to the various pages, and altogether is extremely well got up. The illustrations come from many parts of the world, including England, France, Germany, Italy, Sweden, and

QUERIES.

No. 2712.—Humber Ferries.

I SHALL be glad if readers will give me any recent experience they may have of the Humber ferries at Hull and Goole. Are there efficient means of embarking and disembarking the car at all states of the tide? Also, are the charges reasonable?—G.A.

No. 2713.—15-20 h.p. Krit Gear Changing.

I HAVE a 15-20 h.p. K.R.I.T., 1912 (September), and would like to know if any reader can advise me as to the best method of getting my first gear engaged silently and easily. I find it exceedingly difficult to engage the first gear at all, but the others are quiet and easy. The engine also gets somewhat too hot.—S.W.

No. 2714.—Argyll Sleeve Valve and Dodson Valveless.

I WILL be much obliged if any user of an Argyll sleeve valve engine car will give his opinion as to its power and general reliability. Any reliable information also regarding the Dodson Valveless engine and its behaviour in a car for general use will be much appreciated.—COLONIAL.

No. 2715.—Floor Board Cooling.

WILL any owner of a Daimler 30 h.p. six-cylinder 1913 car kindly suggest some means of lowering the temperature of the floor in the front seat. Sitting next the driver, after a few miles I have to rest on my heels only, the heat is so trying to the feet. The local manager of the Daimler Co. fitted ventilators in the dash without any result. I suggested asbestos packing, but was told that would be useless. The car is driven always at a moderate speed. I tried thick matting also, but with no improvement. Any help to solve the difficulty would be greatly valued.—BOILED.

South Africa. In the concluding portion a specification is given of the 25 h.p. Vauxhall chassis, and details and illustrations of the various optional types of bodies which are recommended for it. We advise those of our readers interested to apply to the firm mentioned for a copy of this booklet, which can be obtained from the London depot, 180, Great Portland Street, London, W.

One of the most informative catalogues that has passed through our hands lately is that of the Skefko Ball Bearing Co., Ltd., of Luton, whose London office is at Carlton House, Regent Street, S.W. There are few engineers, no matter what branch they may pursue, who will fail to find many things of value within the 200 pages of the booklet, while, to all users of power, an acquaintance with its contents may lead to useful economies. The Skefko bearings align themselves automatically to any deflection of the shaft on which they are mounted, and are capable of withstanding axial as well as radial loads. Full information is given of the company's radial and adapter bearings, single and double thrust bearings, ball bearing hubs, etc.

Week-end and Touring Notes.

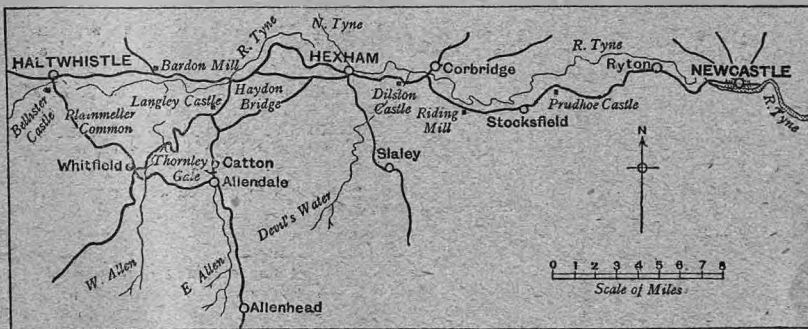
By the Banks of the Tyne and the Allen.

By M. Adeline Cooke. Illustrated by Olive V. Cooke.

(Concluded from page 1063.)

Returning to our car, some two and a half miles of very dusty road brings us to Hexham, where there is much to see. The town is of fair dimensions, and is dominated by the magnificent pile of Hexham Abbey, first founded by the saintly Wilfrid, who brought to the building many Roman stones, as his crypt, which lies below the modern nave, still testifies. Picturesquely situated stands the north portal of the abbey, usually called St. Wilfrid's Gate, although it is of

tains no less than three entrances—one for the use of the priest, one for the worshippers to enter by, and one for them to depart by after viewing the altar piled with sacred relics. Wilfrid obtained the privilege of "sanctuary" for his church, and no part of the glorious building we see to-day holds more thrilling associations than the ancient Frid Stool, or Seat of Peace (which, could the hurried criminal but gain, he was safe), standing on its original spot in the chancel, while



Norman architecture, and it is generally considered that this erstwhile strong gatehouse (the arches alone now remain) and wall surrounding the precinct were erected to defend the monastery in those unsettled times when "a' the blue bonnets were over the Border." The town has seen many stirring events, although one would little think so now, and its origin goes back to Saxon times when the saintly Queen Etheldreda gave her dowry of Hexlamsire to Bishop Wilfrid of York to found what was considered the "chief architectural glory of that age."

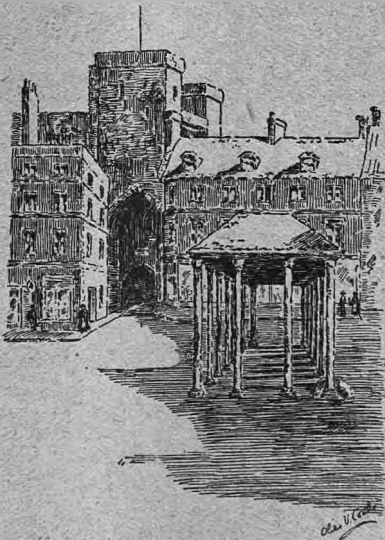
Wilfrid's crypt still remains, and as we descend the steps to it one seems to go back for many centuries. It is built chiefly with Roman stones, some ornamented and some with inscriptions to pagan deities. It con-

tain behind and above it stands a cross of silver. The sanctuary extended for a mile around the church, and two at least of its boundaries can be traced in White Cross Field and Maiden Cross, while up above that superb flight of stone steps in the south transept is a little chamber, where the priest appointed for the purpose watched for the hunted man, or where, perhaps, the fugitives themselves lived and waited. This splendid flight of steps is called the "night stairs," for by this way the monks came during the night to perform their duties.

Hexham had a cathedral for a short period, but the present church is mostly Early English, for Danes and Scots had a hand in destroying and injuring the early structure. It is generally supposed that when the Scots were burning and slaying in 1206 they destroyed what was left of the old nave, and although one was commenced in the fifteenth century it was never finished. A modern nave, admirably built so as to harmonize with the older work, was consecrated in 1668, and now this stately building is indeed a fit shrine for its hallowed memories and the precious treasures it contains.

It occupies some two hours or so thoroughly to explore the Abbey Church, and without going into detail mention must be made of the glorious rood screen, also the chantry of Prior Leschman, wherein still stands the altar. There are also very interesting Roman remains. All who tour in the vicinity should visit the church and allow sufficient time to inspect it.

Hexham possesses other interests. There is the Moot Hall, where councils were held, and where three gates defended the barbican—we can see the hooks on which they swung—and the massive keep stands not far distant, though it is now converted into business offices. Its dungeons were at one period used as the prison. In the



The Moot Hall and Market Place, Hexham.

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LANCIA.—24 h.p. Lancia, fitted with 2-seater coupe body with dickey seat, beautifully fittedprice **£430**

DELAUNAY BELLEVILLE—15 h.p. 6-cylinder Delaunay Belleville landaulette, seating 5 persons inside, beautifully fittedprice **£390**

DAIMLER.—15 h.p. Daimler, 1911 model, fitted with torpedo body, in excellent condition.....price **£325**

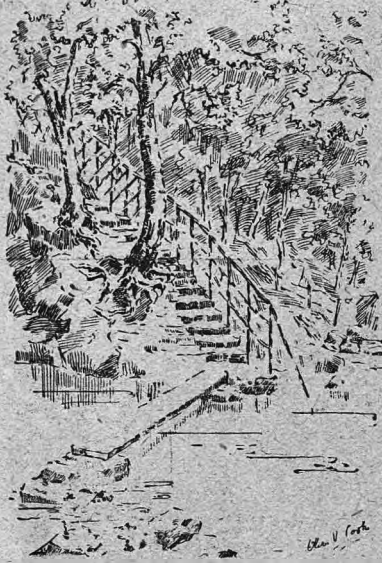
HISPANO SUIZA. - 15 h.p. Hispano Suiza, 1912 model, 4-seater, racing type body, disc wheels, windscreen, very fast carprice **£420**

SIDDELEY.—30 h.p. Siddeley, fitted with handsome limousine body, beautifully upholstered, engine and body work perfect, a real bargain.....price **£275**

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Week-end and Touring Notes (Continued).

immediate vicinity of the town are the delightful Swallowship Woods with meandering walks by a glittering stream. One ancient arch of Linnel's Bridge spans the frothing torrent of the Devil's Water, and there is an inscription upon it, difficult to inter-



In the beautiful Swallowship Woods, Hexham.

pret, "praying that God may preserve Humphrey Errington, who built the bridge in 1581." And here, more than a century earlier, raged the battle which ended so disastrously for the Lancastrians. The Duke of Somerset was beheaded in the market place at Hexham, and Queen Margaret took her darling son and fled up the river. All of us, I suppose, have heard the picturesque story of Queen Margaret and the robber. On the south bank of the Deepdene Burn is the cave—or what remains of it. The way to it is circuitous and not easy, and there are springs in the meadows where that loyal and chivalrous outlaw hid the heroic queen and the young prince.

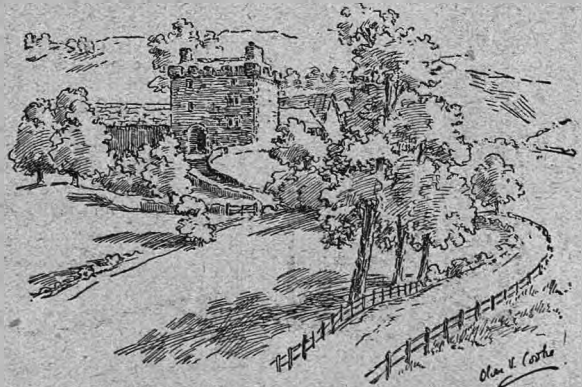
Near Hexham the North Tyne joins the main river, but we keep by the South Tyne until our road crosses it at Haydon Bridge, and a pleasant run brings us to the pretty hamlet of Bardon Mill, some ten miles distant from Hexham. Here we cross the bridge over the wide and sparkling Tyne, turn to the right, and proceed for about a mile along a narrow country lane. That massive tower bulking before us as the green ridges rise higher and higher—what is it? Nothing else than the old Peel of Willimoteswick, a border tower and the birthplace of Bishop Ridley, whom every child knows was burnt with Hugh Latimer at Oxford in 1555.

Massive and strong it stands, with a gateway through the thickness of the wall. Those little windows with a stone pillar between were probably put in in Tudor times, but at the back are the original

narrow slits. We enter the spacious courtyard, and enquire at the modern comfortable-looking house beyond if we may have permission to see the tower. It is readily accorded, and the son of the house most kindly takes the trouble to conduct us up the steep and somewhat difficult steps to the summit of the Peel Tower to see the glorious view. We look far over emerald slopes, woods, and hills, the picturesque country surrounding Belttingham and Ridley Hall, the pleasant hamlet of Bardon Mill, the sweep of sparkling river spanned by the long bridge, and right away to Haltwhistle. Gazing north we can actually see the long high ridge against the sky where still clings the famous Roman Wall built by immortal Hadrian, also Borcombe Hill, striking steadily upwards, from which the Roman station of Borcovicus took its name. We look at the buildings running alongside the Peel Tower, which contain some massive oak beams, and across the large courtyard to the modern house which has only recently been built on the site of the old one, and we are told that when the latter was pulled down there were taken from it oak beams of such weight and size that they had to be cut up before removal. There is still a portion of the original dwelling on one side of the new house, and two old towers, so built that there is no method of entering them except from the top, still remain.

There is something very wonderful about this smiling land with its broad lazy river, its wide fields, where the last of the haymaking and the first gathering of the harvest are proceeding almost side by side. The haycocks are made in quite a different manner from the ones we are accustomed to see in the South, very much higher and more closely piled up, and at sunset they glow like masses of burnished copper. And most beautiful are the sunsets in this fascinating northern country. Beautiful also the pretty villages clustering by the riverside, the cottage gardens fragrant with such stacks of sweet peas as I have never seen in the South of England. Fascinating indeed are the banks of the Tyne; long arms of white pebbles run into the water, graceful trees throw shadows on the water, picturesque bridges and tempting little paths abound.

Retracing our way to Bardon Mill we follow the good high road on the north bank of the Tyne until we reach Haltwhistle, where the church of Holy Cross is worth a visit. It contains an old font, 1676, and what looks like the remains of a holy water stoup, while



The tower at Willimoteswick.

Week-end and Touring Notes (Continued).

the effigy of a knight whose shield bears the Blenkinsopp arms reminds us of the many castles in the vicinity—Blenkinsopp and Bellister, both of which are said to possess ghosts, and Featherstonehaugh, where reigned the noted Sir Albany Featherstonehaugh, whose death Surtees recounts in the ballad which teems with famous northern names:

“Hoot awa’ lads, hoot awa’
Ha’ ye heard how the Riddleys and
Thirlwalls and a’
Ha’ set upon Albany Feather-
stonehaugh
And taken his life at the Dead-
manshaw?
There was Willimoteswick
And Hardriding Dick,
And Hughie of Hawdon and Will
o’ the Wa’
I canna’ tell a’, I canna’
tell a’,
And mony a mair that the
deil may knaw.”

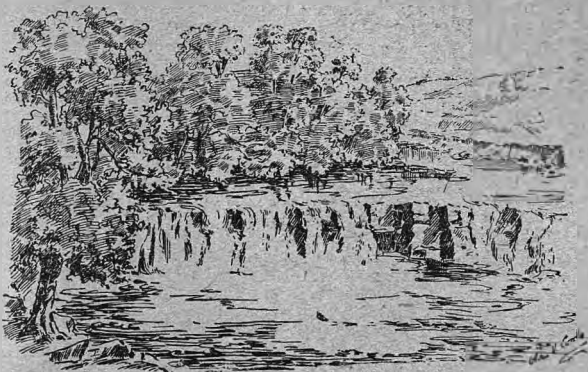
But none of these border castles with their border tals are for us to-day.

At Haltwhistle the South Tyne turns southward to Alston; we turn from it also bent on striking Allendale and the banks of the Allen. So far we have mostly followed the high road, which, although very dusty in places, has been good; now we deliberately choose a circuitous way leading over Flainmeller Common into the high road from Haydon Bridge, thence by Thornley Gate into Allendale Town.

It would have been wiser to have retraced our way to Haydon Bridge or Hexham, and followed the main road, for there seems to be rather a paucity of good connecting roads in this part of Northumbria, as a reference to the map will show.

However, we are at Allendale Town, which, originally given over to miners, is now almost solely occupied by tourists and holiday-makers and the proprietors of the hotels and boarding houses of which the little town chiefly consists. The air is bracing. Up above the long ridges rising from the valley lie wide, windswept moors; in

the valley itself sparkles and dashes the Allen river, cleaving a tortuous, boulder-blocked passage through high cliffs or ravines clothed in foliage or fringed by firs. The scenery is of a very high order, and we enjoy a splendid spin to Allenhead, leaving the car *en route* to visit the Holmes Linn Waterfall, one of the famous spots along this beautiful dale. In the direction of Hexham, to which we are gradually returning, lies Catton, which is also popular with tourists; about five miles distant a crag, hanging over a thickly wooded glen, is crowned with all that is left of Staward Peel. All around are romantic glades, foliage-decked ravines, mossy boulders, and water descending in cascades and cataracts—scenery diverse indeed from the majestic Tyne, and so beautiful that it has been often, and justly, compared to the Trossachs and the Tyrol. The Allen flows into the Tyne near Ridley Hall, and there are many lovely spots of wild and sylvan beauty along its banks. These, however, are for the



Holmes Linn Waterfall, Allendale.

pedestrian, and not for the motorist, so, having gained at Staward the Haydon Bridge Road, we must continue along it, enjoying a peep at Langley Castle, the exterior of which has scarcely altered since it was rebuilt in the fourteenth century by Harry Percy, Earl of Northumberland. It was soon gutted by fire (probably burnt by Henry IV. as punishment for the Earl's rebellion), and thus it remained until recent years, when the historic old pile was again converted into a private residence. We now proceed towards Haydon Bridge, to greet once more the Tyne at ancient Hexham.

Mr. Gerald Herbert informs us that he is resigning his connection with the Singer Motor Co., Ltd.

The War Office has for the second year in succession contracted for all its steel-studded tyres for the year with Messrs. Chas. Macintosh and Co.

Christian Lielsen, of Hamburg, informs us that he is desirous of receiving catalogues from makers of two-seated cars not weighing more than 10 cwt.

The Dunlop Rubber Co., Ltd., now date from 63, Bath Street, Glasgow, whither all communications relating to Scottish business should be addressed. The repair works, despatch, and solid tyre departments, are located at 60, North Wallace Street, Glasgow.

We are informed that R.C.H. cars are now represented in Leicester by Parr's Garage, Granby Street; in Nottingham by Mr. Walter Stevens, Trent Bridge; and in Newport Pagnell by Mr. A. Rose, Swan Hotel Garage.

A feature of two road maps of Northumberland and Lancashire, recently issued by Messrs. Gall and Inglis, lies in the fact that in each case the map is printed back and front. It is a most convenient arrangement, as it means that a large area on a scale of half an inch to the mile can easily be referred to without having to unfold a cumbersome map. When following a road it is quite an easy matter to turn over the map and follow the continuation on the other side, for the roads run right to the edge on both sides. Both maps sell at 6d. each, or mounted on cloth, 1s.

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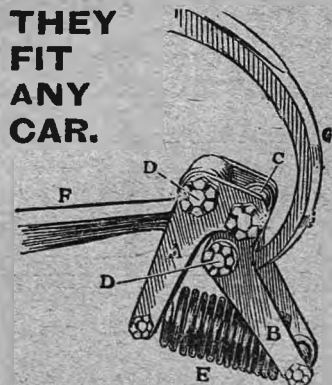
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"The Autocar" Share List.

The following table of some of the companies connected with the motor, motor cycle, and allied trades, is not published for the benefit of speculators, but for the information of investors. The speculative buyer is referred to the daily financial press.

Issued Capital.	Amt. of Share	NAME OF COMPANY.	Present Prices.	Last Year.		This Year.		Last Div.	Div. Payable
				Highest	Lowest.	Highest	Lowest.		
£ 2,520	1/	Abingdon-Ecco, Ltd.	2/6 3/6	3/-	2/3	3/6	3/-	Nil	Nov.
45,000	£5	Aldays & Onions (£3 paid)	3 3/4	4 1/2	3 1/2	3 1/2	3 1/2	5	Ap/Dc
50,030	75	" " 6% Cum. Pref.	5	5 1/2	5 1/2	5 1/2	5 1/2	6	Ap/Dc
209,802	10/-	Argylls, Ltd.	5/9 6/1 1/2	6/-	4/-	6/-	4/9	Nil	Dec.
150,000	£1	Belsize Motors, Ltd.	25/- 26/-	28 1/2	25/-	27/6	26/-	8	My/Nv
100,000	£1	" " Cum. Pref.	20/-	20/-	20/3	20/-	6	Fb/Au	
44,771	£1	Bowden Brake, Ltd.	4/6 5/6	7/-	3 1/2	5/-	3/-	Nil	Dec.
766,982	£1	Birm'gham Sun' Arms, Ltd.	46/- 46/6	53/3	46/3	50/-	47/6	10	Mr/Sp
203,150	£5	" " Cum. Pref.	5 1/2 5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5	Mr/Sp
75,000	£5	Braimpton Bros. Cum. Pref.	4	4 1/2	4 1/2	4	3 1/2	6	Oct.
100,000	£1	Brooks, J. B., & Co., Ltd.	36/-	37/6	31/-	36/6	35/-	5	My/Nv
100,000	£5	" " Cum. Pref.	5	5 1/2	5 1/2	5 1/2	5 1/2	5	My/Nv
100,000	£5	Brown Bros. Cum. Pref. ...	4 1/2 5	5	4 1/2	4 1/2	4 1/2	6	Ap/Dc
380,000	£1	Charron Par. Pref. Ord. ...	13/- 13/6	11/6	8/-	14/-	7/9	9	Ju/Oc
200,000	£1	Clément-Gladator	3/3 3/9	3/-	1/6	6/-	2 1/2	Nil	Dec.
100,000	£1	" " 6% Cum. Pref.	14/6	14/6	10 1/2	15/-	12/6	5	Ju/Dc
55,000	£1	Components, Ltd.	5/6	6/9	4/-	7/9	6/-	Nil	Dec.
25,317	£1	" " 7% Cum. Pref.	12/6	15/-	11 1/2	13/-	12/-	7	Dec.
275,000	£1	Darraeq. A. & Co., Ltd. ...	12 10 1/2 13 1/2	18 1/2	8/9	15/-	9/9	Nil	Ju/Dc
375,000	£1	" " 7% Cum. Pref. Ord.	14 1/2 15/3	19 1/2	11 10 1/2	16/-	13/-	Nil	Ju/Oc
159,229	£1	De Dion-Bouton, 7% Ord.	7/- 8/-	11 1/2	8/9	10/-	7/6	6	Dec.
1,000,000	£1	Dunlop Rubber	38/-	66/9	27/6	39/6	35/6	12 1/2	Ap/Oc
200,000	£1	" " Cum. Pref.	19/6	21/-	17/-	20/-	18/6	6	M/SD
312,785	£1	" " Income Stock	17/9	19/-	15/6	19/-	17/6	5	Ju/Dc
624,995	£1	Dunlop Parent Co. 8% Ord.	15/6 16/-	18 7/2	10/-	18/-	13/9	10	Ju/Dc
994,990	£1	" " 5% Cum. Pref.	12/6 12/9	16/9	10/6	15 1/2	12 7/2	5	Ju/Dc
499,962	£1	" " Deferred	9/- 10/-	15/-	6/3	11/-	8/-	Nil	Ju/Dc
99,977	£1	Enfield Cycle	19/- 19/6	19/9	13/9	21/9	18/-	5	Oct.
24,985	£1	" " Cum. Pref.	21/- 22/-	21/3	20/6	23/-	21/-	7	Fb/Oc
292,904	£1	Humber, Lt. (New)	9/6 10/-	7/6	3 7/2	14/-	6/9	Nil	Nov.
331,495	£1	" " £ Cum. Pref.	15/- 15/6	11/-	6/9	17/9	10 1/2	Nil	Nov.
50,000	£1	James Cycle	11/3	6/6	5/-	15/-	6/6	Nil	Oct.
100,000	£5	Lucas, Joseph, Ltd.	9 1/2	9 1/2	5 1/2	9 1/2	9 1/2	5	Ap/Nv
100,000	£5	" " Cum. Pref.	5 1/2 5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5	Mr/Sp
73,385	£1	New Hudson Cycle Co. ...	23/-	24/6	14/6	28/-	24/6	10	Nov.
18,033	£1	" " Cum. Pref.	19/3	20/-	18/-	19/6	19/-	6	Mr/Nv
50,000	4/-	Premier Cycle	4/- 4/3	5/-	3/-	5/6	4 1/2	15	Sept.
125,000	10/-	" " Cum. Pref.	7/6 7/9	8/9	6/9	8/6	7/3	7 1/2	Sept.
31,000	£1	Riley (Coventry), Ltd.	5/9 6/-	8/9	5/3	7 1/2	5/-	Nil	Feb.
200,000	£1	Rolls-Royce	44/3	47/3	36/3	48/6	44/6	30	Ju/Ju
138,662	£1	Rover	38/9 39/6	31/3	12/6	40/-	30/9	10	Nov.
100,000	£1	Rudge-Whitworth, Ltd. ...	19/6	24/-	15/-	25/3	18/-	5	Oct.
100,000	£5	" " 6% Cum. Pref.	3 1/2	5 1/2	3 1/2	4	3 1/2	6 1/2	Dec.
41,621	6/-	Siddeley-Deasy	11/6	10/6	6/-	11/-	8 10 1/2	8 1/2	Oct.
50,007	£1	Singer & Co., Ltd.	17/- 18/-	19/6	6/6	19 1 1/2	16/-	Nil	Oct.
70,000	£1	Star Engineering, Ltd.	11/- 11/6	18/6	10/6	17/-	11/3	5	Mar.
69,157	£1	" " Cum. Pref.	15/6	18/-	15 1/2	17/6	15/6	7	Mar.
87,550	£1	Stepney Wheel	29/9	35/-	30/-	32/6	29/6	20	Mr/Oc
120,000	£1	Sunbeam Motor Car	56/6	59/-	37/6	59/-	52/-	25	Nov.
30,000	£1	" " 6% Cum. Pref.	21/9	23/3	20 1/2	22/6	21/6	6	Ap/Nv
80,000	£1	Swift Cycle	18/6 20/-	21/9	13/-	24/-	19/9	6	Dec.
100,000	£1	" " 6 1/2% Cum. Pref.	16/-	17/3	14 10 1/2	17/3	16/3	6 1/2	Ju/Dc
80,000	£1	Triumph Cycle	75/-	71/6	43/9	82/-	68/-	30	Nov.
50,000	£1	" " 5% Cum. Par. Pref.	23/-	23/6	20 7/2	24/6	21/6	10	Nov.

* Interim. a Final making 20 % for year. b actual on account of arrears. c Including all arrears.
 Business has been very quiet during the past week, with an easier tendency all round. Rudge-Whitworths, after being offered at 18s., had a smart recovery to 20s. bid, but closed under the best.

"The Autocar" Diary.

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|---|---|
| June. | July. |
| 19.—Cardiff M.C. and South Wales A.C. Open Hill-climb at Caerphilly. | 26.—Notts A.C. Inter-club Hill-climb for the Du Pre Cup. |
| 21.—Cardiff M.C. and South Wales A.C. Open Speed Trials at Porthcawl. | 28.—Grand Prix de France and Coupe de la Sarthe. Le Mans. |
| 22-29.—Austrian Alpine Tour. | August. |
| 23.—Notts A.C. Clipstone Speed Trials. | 10.—Mont Ventoux Hill Climb. |
| July. | September. |
| 5.—Yorkshire A.C. Speed Trials on Saltburn Sands. | 21.—Coupe de l'Auto, Boulogne Circuit. |
| 5.—Mersey M.C. Colwyn Bay Open Speed Trials. | Nov. |
| 12.—Grand Prix Rate. Picardie Circuit. | 20-27.—Marine, Motor Boat and Stationary Engine Exhibition, Agricultural Hall, promoted by the S.M.M.T. |
| 19 and 20.—R.A.C. of Belgium Grand Prix Race. | |

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