

THE AUTOCAR

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

EDITED BY H. WALTER STANER.

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An Index to Advertisements appears on page 5a.

Notes.

Road Tarring Warnings.

We have had so many complaints from our readers about the damage done to their cars through road tarring that we have tried to evolve a system whereby they may be warned of the particular sections of road which are likely to be under treatment within the few days following the publication of any issue of *The Autocar* during the tarring period. It is only possible to make this information useful by the kind co-operation of the county surveyors, who in many cases have been good enough to send us an intimation of their tarring programme for the next few days. It will be understood that, necessarily, these intimations as to probable activities are based on weather conditions:

any heavy rains are likely to delay the operations in direct proportion to the duration and severity of the downfall. Then, again, there is the question of drying; for instance, assume that notice is given in *The Autocar* that tarring operations on a certain road are expected to be finished to-day, the 21st of June: it may be taken that under ordinary circumstances the road will be quite suitable for use without the smallest inconvenience within three or four days. It is this fact that within three or four days of the completion of the tarring the inconvenience is entirely over except in cases of very bad tarring, which makes it difficult to issue warnings of the ordinary sort; the trouble is only transitory. It is, therefore, obvious that all warnings must be in the form of anticipations and not issued after the tar has been laid, as, in the latter case, by the time a warning had been published the particular section of road in question would probably be dry. Consequently, it is only through the courtesy of the authorities directly responsible for the tarring of the roads that we are able to help our readers in this matter, and we wish publicly on their behalf, as well as our own, to thank sincerely those surveyors who are kindly co-operating with us in the matter.

The R.I.A. on Road Tarring.

On another page we print the practical hints upon the tar treatment of road surfaces which are now being issued by the Roads Improvement Association, of 15, Dartmouth Street, Westminster, S.W. These instructions are being supplied at a penny per copy to all who wish to have them, and we have no doubt that many will avail themselves of the opportunity. This issue on the part of the Roads Improvement Association is only an instance of the constant good work which is being done by it: it is really wonderful what it does with its comparatively limited revenue. It does not receive a tithe of the support that it is worthy of; indeed, now that the road question becomes more and more important every day we question whether there is any association connected with motoring which is as worthy of monetary support as the R.I.A. It is true that the leading organisations make an annual grant towards its funds, but we consider that the assistance they give it is small compared with its merits, and that a good deal of the money which they spend in other directions might be far more advantageously allocated to the really practical activities of the Roads Improvement Association. It has a most capable secretary in Mr. Wallace E. Riche, and it is fortunate, in that its council is composed almost exclusively of really expert and practical men, who devote an immense amount of time to entirely honorary work on its behalf. The membership subscription is the nominal sum of five shillings per annum, so that all classes of road users are able to lend it support whether they ride a pedal bicycle or own a fleet of road destroying lorries. It would be an immense help to the Association if the number of private motorists who are annual subscribers of a guinea were greatly increased, and we

Notes.

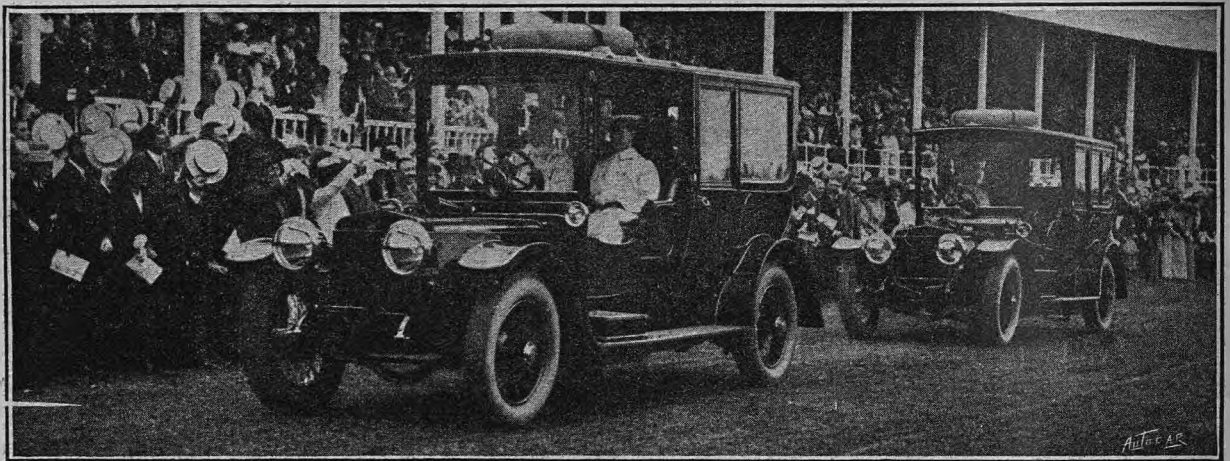
hope that all who can afford to do so—and who is there who cannot?—will become subscribers for at least that amount.

To return to the R.I.A. "Notes upon Tar Treatment of Road Surfaces," these will, undoubtedly, be not only most useful to many local authorities who are engaged in tarring operations, but also of service to many who are inclined to set their face utterly against surface tarring because of the bad results which they have experienced in so many quarters. If they will study the very practical suggestions of the R.I.A. they will see at once how it is that in one place they find tarring which is as satisfactory as any surface treatment of the roads can be, while in another district they come across tarring that has been equally unsatisfactorily carried out.

It should be borne in mind that the suggestions of the R.I.A. are not the ideas of mere theorists, but are to all intents and purposes precisely the same as the views held by the experts upon the Road Board, as

the Association is fortunate in that it has not only the moral support of the Road Board so far as a Government department can support such an association, but also the inestimable advantage of the personal advice and interest of Colonel Crompton, the Road Board engineer, who is one of the most valued members of its council and a vice-chairman.

Incidentally, too, the notes show the point that we brought out not long since with regard to the necessity for the training of really intelligent road repairers, and they show very plainly that satisfactory tarring cannot be carried out by unintelligent workmen—indeed, it is not too much to say that before very long road repairing will occupy an altogether different plane from that which it has held in the past. This gradual education of the roadman will, we believe, have almost more to do with the ultimate improvement of the roads than anything else, and it will, naturally, bring the calling on to an altogether higher status than that which it has hitherto occupied.



The King and Queen arriving at the Richmond Horse Show.

"The Autocar Handbook."*

This highly popular work, which in its fifth edition has been brought right up to date, should be found on the table or on the book shelves of every individual man or woman who owns a self-propelled vehicle, or who is interested therein. In Chapter I. petrol, steam, and miniature cars are dealt with in a discursively general manner, and the cost of running is discussed in detail. The petrol engine in its various forms of four and six-cylinder types is dealt with, its cycle of operations and valve manipulation being clearly described, and illuminatingly illustrated. Sleeve and twin-cylinder V types are lucidly treated, and the principle of the two-stroke engine is clearly explained. Horse-power, that caviare quantity to the multitude, is quite comprehensively presented. The chief ganglion or nerve centre of the petrol engine, the carburetter, is naturally given very comprehensive treatment, and the general action of the apparatus is made clear by deductions from the original surface type upwards. Several of the leading carburetters are illustrated and described in detail. Under the heading of "Ignition" the magneto is luminously described, so that its construction and operation together with its fitting and adjustment are made plain to a commonsense reader. In Part II. of the ignition section, accumulator and coil ignition is dealt with in a very complete manner, although the number of motorists to whom this system appeals now grows smaller day by day. The up to date form of dual ignition also receives treatment. One would expect to find the highly important subject of lubrication dwelt upon incisively, and this is done in this excellent

work. Forced and thermo-syphon systems of cooling are explained by text illustrations. Little is left to the imagination when the chapter on Control of the Engine has been perused. That box of mystery to the novice, the change-speed gear box, and the subsequent drive is described in many of its varied forms, while the manner in which the change-speed gear operates is set forth in a manner comprehensible to every reader. The frame and springs have a chapter to themselves. Bearings are interestingly discussed, and the road wheels have their turn. In this section the latest form of detachable wheel is described. Readers will profit by the dissertation on tyres and their treatment, and no one should suffer from brake failure if Chapter XIV. be carefully studied. The steering gear, another puzzle to the uninitiated, is lucidly set out, the Ackerman system, which has made the direction of a motor car as safe and perfect as possible, being very clearly shown in diagram form. After dealing with lamps and lighting systems, steam cars are quite generously dealt with, and the light runabout or cycle car comes in for attention. Finally, if the owner-driver will care for, manage, and drive his car as adjured and instructed in Chapters XXI. and XXII. he will assuredly motor on a bed of roses. Chapters on accessories, tools, and spare parts, touring, Brooklands, the motoring institutions, and the law complete this most useful work, save for certain necessary and useful tables of registrations, speeds, revolutions, etc. A careful and profuse index is appended. No motorist, ancient or modern, should be without this, the most complete work of its kind yet offered to motorists. The illustrations are so clear and numerous that many matters are plain almost without reference to the text.

* "The Autocar Handbook" (Fifth Edition). A guide to the motor car. H.M.S. & Sons Ltd., 20, Tudor Street, London, E.C. 1/6 net.

Useful Hints and Tips.

Difficult Starting—Magneto or Carburetter, Which?

I OFTEN wonder whether fellow motorists experience the same difficulty as I do at times in diagnosing the cause of troublesome starting.

My car is sometimes left standing three or four weeks in a somewhat damp shed, say during the winter, and when required I sometimes fail to start the engine, and have great difficulty in finding out the cause of the trouble. In the first place, the engine is fitted with magneto ignition only; the jet nozzle is inaccessible without disturbing the adjustment, and the float chamber needle valve is hidden. It is, therefore, difficult to tell quickly whether the ignition or carburation is responsible, and I think it is time the magneto or accessory people gave us something to test our magnetos more easily.

Some time ago I wrote to the Bosch Company in Germany, suggesting for this purpose a combination of a short length of wiring and a visible spark gap, the wiring to be attached to the high tension collector terminal, and the spark gap to clip on to the radiator or front part of the car near the starting handle. The idea is, of course, to enable the driver single-handed to tell, without having to remove it, whether the magneto is functioning properly. In the ordinary way it is almost impossible for anybody, single-handed, to turn the starting handle fast and examine closely the sparking plugs which have been removed from the engine. The Bosch Co. referred the matter to their London house, but I have heard nothing further.

On the occasions referred to when I have failed to start the engine easily I have felt the necessity for some simple and quick means for proving the magneto to be in order, so that I could devote the necessary attention to the carburetter and petrol supply or *vice versa*.

In place of testing the magneto on such occasions I have been in the habit of adopting a rough and ready, and perhaps somewhat brutal, test of the carburation system whereby I can ascertain whether there is an explosive mixture in the engine and whether this is too rich. The latter point is important, as I have generally found that most difficulty is experienced in starting when the mixture is excessively rich.

The test merely consists in removing a sparking plug and inserting a lighted match into the cylinder. If there be no gaseous mixture, the match merely goes out. If the mixture be correct, or approximately so, there is a mild explosion. If it be too rich a luminous flame appears for a second at the sparking plug hole, standing up about an inch or two, somewhat resembling the flame of a candle; its very colour suggesting excessive richness. If on this rough and ready test get a mild explosion I take it the carburetter is right and the ignition wrong, and proceed accordingly.

As an example of how useful this test is I may mention a recent instance. I had some days previously driven the car into the motor shed at the end of a hundred miles run. A week afterwards I wanted to start the car, and the engine started up properly, but after a few seconds running it stopped, and failed to start. By means of the test mentioned, without interfering with either the carburetter or magneto I found that there was no mixture in the engine, and tracing back, the petrol tank was found empty, so I had apparently reached home from the previous journey with only about enough petrol left to fill the float chamber.

It is advisable to be careful in selecting which cylinder is tested in this way, as in a four-cylinder engine there is always one cylinder in which the inlet valve is open, and if the lighted match be inserted in that cylinder there is risk of the gas firing back along the induction pipe into the carburetter. It is, therefore, well to see that the inlet valve is closed, and as the sparking plug is generally arranged over the inlet valve this is not a difficult matter.—ERIC W. WALFORD.

A Cure for Popping Back.

A correspondent tells us that he had an engine which, when run for any length of time, persisted in popping back into the carburetter. He consulted the makers and also the local experts and mechanics without obtaining a remedy: one and all attributed it to insufficient petrol, *i.e.*, to too weak a mixture, but enrichment did not provide a remedy. The owner eventually overcame the trouble himself by changing the plugs for a set with a longer reach, *i.e.*, projecting further down into the valve pocket. First of all he tried a mere change of plugs with the same reach, and this was useless; then he tried the longer set and the cure was effected.

Of course we do not assert that this would cure all cases of popping back, but when the ordinary remedies have been tried it is certainly worth consideration, as it is so simple. At the same time the theory of the remedy is rather subtle. It is easy enough to see that the longer plugs would cause the spark to take place more in the midst of the incoming mixture; indeed, it might be said, speaking broadly, that the incoming mixture would pass through the spark of a long-reach plug, while it would pass under the spark of a short-reach plug. This is all very well, but why the short-reach plugs should have caused backfires is not clear, though in the case we have just cited they became incandescent, but why they should have done that when the long-reach plugs did not require explanation.

The explanation of the apparent contradiction offered by our correspondent is a very good one. His theory is that the short-reach plugs failed to ignite the mixture early enough, and that through this late ignition the overheating resulted, this causing the short-reach plug points to become incandescent, so that they fired the incoming mixture prematurely and before the inlet valve was closed, and resulting in the flame of the explosion passing back into the carburetter and so causing the popping. This is quite a sound theory, as, after all, overheating, when it is brought about by late firing, is not really overheating in the sense of excessive temperature but, rather, it is excess of heat at the wrong end of the stroke; in other words, through the mixture being fired late the heat which should be given early in the stroke and converted into work is generated so late that the exhaust valve opens while the temperature is excessive, and, consequently, the heat is not only wasted through the exhaust, but unduly heats the engine and, incidentally, the plug points. Probably a remedy for the trouble could have been obtained by advancing the ignition: even with the short-reach plugs. Indeed, many modern engines have their valve pockets too shallow to admit of the use of long reach plugs, as the inlet valves would touch the plug points.

The Great Alpine Contest.

Facts and Figures about one of the Great Events of the Year. An Extended Route. The Conditions of the Competition. By C. L. Freeston, F.R.G.S.

THERE is no gainsaying the fact that the Oesterreichische Alpenfahrt, or Austrian Alpine contest, has effected the miraculous in automobile history. Year by year, since the thousand miles trial of 1900, the annual competitions in one country or another had gradually become more and more strenuous, but the efficiency of the motor car itself increased to a still greater degree, and first in Great Britain, with its reliability trials, and then abroad, with its Herkomer and Prince Henry contests, the day of abandonment arrived because there seemed no obstacle to put before the all-conquering car which it could not easily surmount.

But there remained the Alps! To western minds these are so frequently associated with Switzerland alone, and the hostility of the average Swiss to motor vehicles is so well known, that, to Englishmen at all events, the idea of an annual contest being feasible in that region had hardly suggested itself, and even when the Alpine contest was established by the Imperial and Royal Automobile Club of Austria in 1911 the event passed almost unnoticed, from sheer lack of knowledge as to the highly interesting nature of the competition and the territory through which it passed.

An English car was entered, however, for last year's Alpenfahrt, and another accompanied it as a free lance; as a result, the event received the publicity which was its due in the English press, and its all but epic character came to be understood.

The route of this year's contest differs somewhat from that of 1912, but is no less strenuous, and even on the score of long distances alone its formidable nature may be gathered from the following itinerary:

		Kiloms.	Miles.
June 22nd.	Vienna to Salzburg	413.6	= 256
" 23rd.	Salzburg to Innsbruck	417.9	= 259½
" 24th.	Innsbruck to Riva	393.1	= 244
" 25th.	Riva to Toblach	306.2	= 191
" 26th.	Toblach to Trieste	329.3	= 203½
" 27th.	Rest day in Trieste	—	—
" 28th.	Trieste to Klagenfurt	389.6	= 241
" 29th.	Klagenfurt to Vienna	412.1	= 259¼
Totals	...	2,667.8	= 1,654

Now these figures give an average of 372 kilometres, or 230½ miles *per diem*, and that of itself is no light undertaking for the competitors. But mere figures as to mileage are absolutely delusive in this connection unless they are also accompanied by further details as to the heights of the Alpine passes which have to be traversed. Of these, as a reference to the map will show, there are no fewer than nineteen, and they may

be set out as follows in the order in which they occur: Semmering, 3,149ft.; Niederalpl, 4,130ft.; Pass Lueg, 1,829ft.; Tauern, 5,695ft.; Katschberg, 5,383ft.; Brenner, 4,495ft.; Reschen-Scheidegg, 4,901ft.; Broccone, 5,305ft.; Gobbera, 3,339ft.; Rolle, 6,424ft.; Pordoi, 7,382ft.; Falzarego,

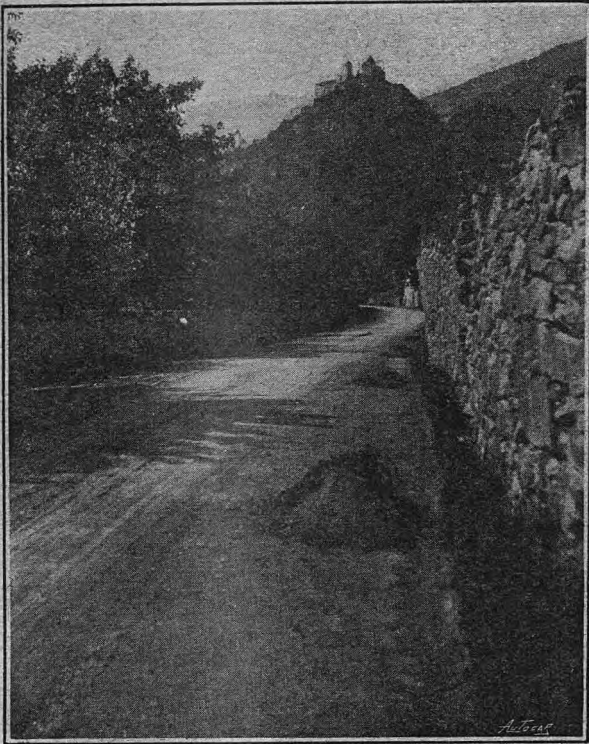


The route of the Austrian Alpine Tour.

6,913ft.; Ampezzo, 5,065ft.; Kreuzberg, 3,596ft.; Wurzen, 3,512ft.; Predil, 3,629ft.; Monte Maggiore, 4,275ft.; Loibl, 4,494ft.; and the Stubaizer, 5,416ft. It is not to be assumed, of course, that each of these summits has to be attained from sea level; but on the other hand it must be borne in mind that in the case of passes within measurable distance of each other, such as the Rolle, the Pordoi, and the Falzarego, there is a considerable drop from one before the ascent of the next is begun, and that the negotiation of "hair-pin" corners is more difficult on the down grade than on the up, for in addition to the nicety of control required for the steering round the corners in either case, the question of brake control has to be taken into account on the descending side.

Still, it is the ability to climb which is the most impressive factor in the case of the car itself, as apart from the skill required in its control, and a mere glance at the itinerary for each day will show the stiff nature of the task which the competitors in the coming contest have to face. On the fourth day, for example, they have to ascend from Riva, which is almost on the level of the sea, to the summit of the Broccone Pass, a rise of from 230ft. to 5,315ft.; they then descend to Canale S. Boro, 2,490ft.; cross the saddle of the Gobbera, descend to Imer, 2,133ft., and rise to the Rolle summit, 6,424ft. Descending to Predazzo

(3,337ft.) they have then to scale the Pordoi (7,382ft.), the highest road in Austria save the Stelvio, and descend to Arabba (5,253ft.). Next comes the Falzarego (6,913ft.), and another descent to Cortina (3,983ft.),



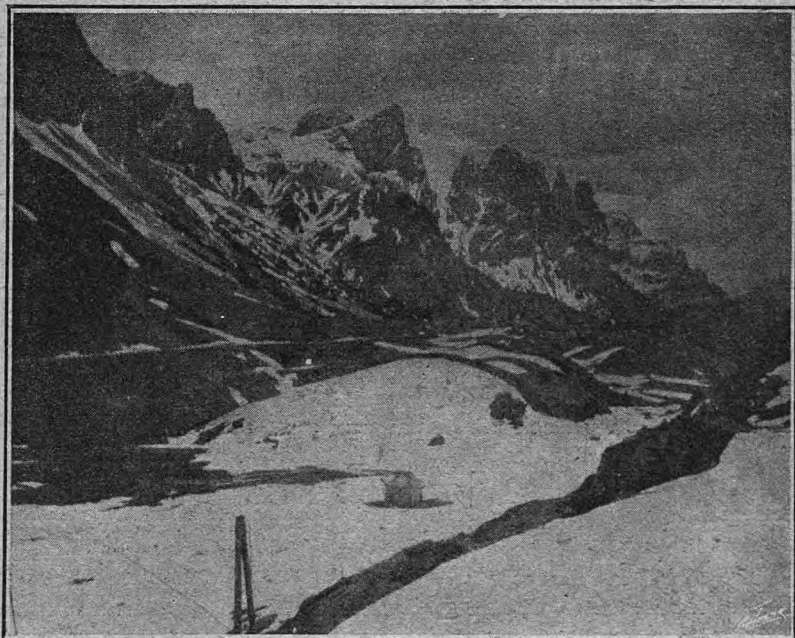
A view on the Brenner Pass.

followed by the ascent of the Ampezzo Pass (5,065ft.) ere the final point of the day's journey is reached at Toblach (3,965ft.). By the ordinary tourist the crossing of the Pordoi and Falzarego would reasonably be regarded as a good day's work, but here we have, in the Alpine contest, a journey of no less than 306 kilometres to be made, with no fewer than six passes thrown in, all of them but one being of formidable height. As a test of the all-round reliability of the cars engaged, and of the endurance of their drivers, this one day's journey alone stands out as in every way remarkable.

The second day's journey, again, is no trifling undertaking, for it includes, in the course of a 418 kilometres run, the two stiffest passes in the Alps—the Tauern and the Katschberg. The nature of these roads has so recently been dealt with in *The Autocar* that I need not expatiate upon their affrighting difficulties further at this juncture; but at least it may be said in passing that there will be many thankful drivers and passengers alike on the evening of June 23rd when Innsbruck is safely reached after conquering the terrors of these dreaded passes. The Loibl is another pass which needs to be treated with no small respect, for it has gradients of no less than twenty-two per cent.,

The Great Alpine Contest. with many corners to be rounded. As for the Stubalpe, it is, to my mind, the worst feature of the whole trial. The road is very narrow, and often very steep into the bargain; but, above all, it has the vilest surface that the mind of the car-driver could conceive, and quite unlike anything that he is likely to encounter elsewhere in Europe. In a word, the Stubalpe is one long-drawn agony of donkey-backs and *caniveaux*, and in consequence of these the descent has to be made at a veritable crawl throughout. Until one has actually experienced the "delights" of descending the Stubalpe on a car one simply does not know what bumping means, and if I were to state the number of hours which the journey involved when I made it last year, from the sheer necessity of saving one's own bones and the springs of the vehicle, I doubt whether I should be believed. This road, of course, as with the case of the Tauern, Katschberg, and Loibl, is included in the Alpine contest purely for knock-out purposes, as ordinary pass-climbing over the skilfully engineered routes, no matter to what height, does not disturb the equanimity of the driver of an up-to-date and highly efficient car.

While in the main the route for this year's contest is kindred to that of last year, the itinerary not only differs in several respects, but is arranged on a better plan, chiefly with the object of finishing each day's run, where possible, in a place where the hotel accommodation is not lacking. Considerable difficulty was experienced last year in finding quarters for so large a number of tired and hungry competitors, and at one place in particular—Spittal-an-der-Drau, the condition of things which prevailed at the close of the first day's run can only be described as chaos. This time, however, the terminal point for the opening run will be Salzburg, and almost the entire journey will differ from that of last year. The only section common to each is the saunter over the Semmering Pass, but whereas in 1912 we ran to Bruck, Leoben, Liezen, Radstadt, and over the double terror of the Tauern and Katschberg to Spittal-an-der-Drau, we shall turn aside this year at Mürzzuschlag, cross the Niederalp to Amstetten, and from there follow the main road



A view on the Rolle Pass.

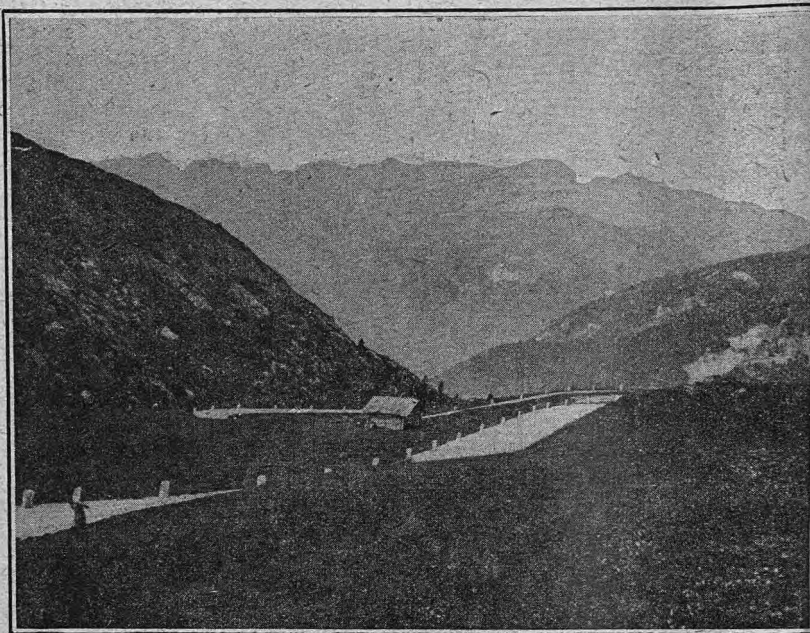
The Great Alpine Contest.

through Enns, Wels, and Lambach to Salsburg, without touching, however, any of the charming lakes of the Salzkammergut. As the Niederalpl is not particularly lofty, there is nothing to be thought of in this opening run, but mere kilometrage, though that is not to be despised, inasmuch as it amounts to 413.6.

The second day's journey is not only longer but includes, as above stated, the ascent and descent of the Katschberg and Tauern Passes, which will necessarily be taken in the early hours of the day. Then Lienz has to be reached from Spittal, after which the long Pusterthal will be traversed from end to end, and at Franzesufeste we turn north for the Brenner Pass. At Sterzing, half way up, we branched off last year and crossed the newly opened Jaufen Pass to Meran, and then, after reaching Bozen, were side-tracked on to the Mendel Pass before steering for Trient; but this year we shall cross the Brenner in its entirety and descend to Innsbruck, the capital of Tyrol.

From there the route strikes westwards on the following day to Imst, then southwards to Landeck, from where the Reschen-Scheidegg Pass will be crossed to Nauders and Neu Spondinig, at the foot of the Stelvio. There was some talk originally of including this famous climb in the itinerary, but as the summit marks the limit of Austrian territory it would have been necessary to turn round at the top and come back over the same road. At Neu Spondinig, therefore, the cars will be headed eastwards for Meran and Bozen, and from there proceed to Trient by the straight road without going over the Mendel. The day will not wind up at Trient, however, but at Riva,

on the head of the beautiful Lake of Garda. The whole of this, the third day's journey, will be new as compared with last year's route save for the short stage between Meran and Bozen, and the further por-



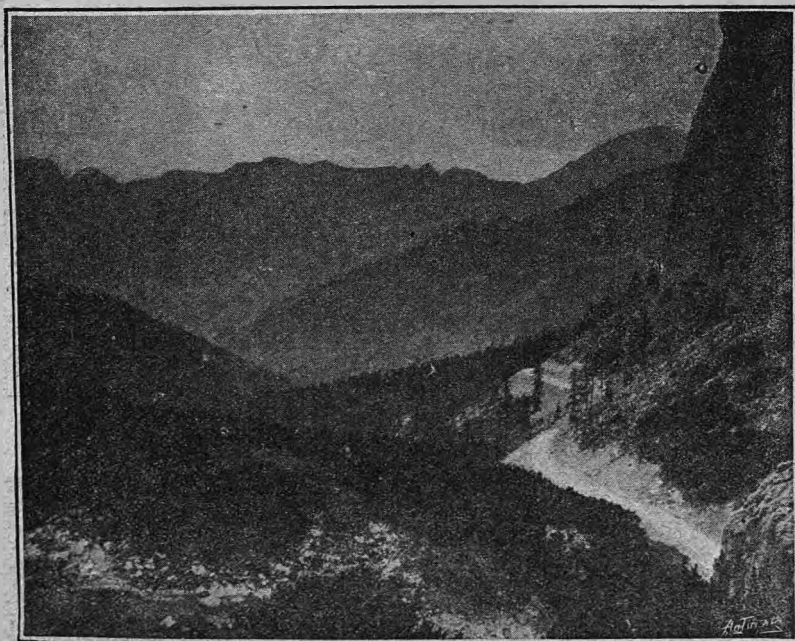
On the Pordoi Pass. The summit of the road is 7,382 feet above sea level, the second highest pass in Austria.

tion between the southern end of the Mendel Pass and Trient.

The severe nature of the fourth day's run, leading as it does over six passes, has already been indicated in passing. As for the fifth day, it remains as last year, and goes over the Kreuzberg, the Wurzen, and the Predil Passes, through Hermagor, Riegersdorf, Tarvis, and Görz to Trieste, where a welcome day's rest may be enjoyed. The accommodation at this

Adriatic port, by the way, was taxed to the utmost last year, as the season was at its height, but this year's contest is not only a fortnight later, but will not be so overcrowded with competitors.

Considerable modifications have been effected in the homeward run to Vienna, in order to reach the capital within two days, as compared with the three of last year; for it must be remembered that, owing to the westward diversion to Landeck, Trieste is reached a day later than on the previous occasion. As before, the itinerary will proceed southwards in order to take in Monte Maggiore, but from Matuglie, instead of striking for Laibach—where, by the way, a particularly hospitable welcome awaited us last year—a return will be made to Görz and St. Lucia. Here a new stretch of road will be followed to Krainburg, and then last year's route will be taken, over the stiff Loibl Pass, to Klagenfurt.



The Falzarego Pass.

From there, on the morrow, the competitors will make straight for the awful Stubalpe, instead of going round by Gráz. There will be no diversion, moreover, at Leoben over the Prebühel to Hieflau, and back over the Niederalp, the latter having already been included in the outward journey. As before, however, the run home will cross the Semmering a second time on the way to Wiener Neustadt and Vienna. Thus, whereas the route from Trieste to Vienna was made up of three stages of 297½, 256½, and 373 kilometres respectively in 1912, it will be compressed this year into two stages of 389.6 and 418.1 kilometres, with a saving of some 136 kilometres. The total distance of this year's itinerary, however, will be 347.4 kilometres longer than before, and the six passes to be compassed on the fourth day will be included in a run of 306.2 kilometres as compared with one of 260.5 kilometres only.

Enough has been said to show that the contest will be one of extraordinary severity, especially when it is borne in mind that the competing cars will be in full touring rig, and that quite a number will be driven by amateur owners. Whoever emerges from the ordeal with a clean sheet will have accomplished something which will redound to his own credit as a driver and to that of the chassis alike.

As regards the regulations for this year's contest, it must be pointed out that they differ in several respects from those of last year. A non-stop performance will again be the chief object to be attained, but it will not of itself suffice to gain a prize. Despite the difficulties of last year's route, no fewer than twenty-four competitors completed the itinerary without having lost a mark, and not only had two prizes to be added to the twenty-two which had been presented by various people, but lots had to be drawn ere the distribution could be made, while no one could claim the proud distinction of being the actual winner. To obviate a recurrence of this undesirable state of things, an elimination will take place on the day following the completion of the contest, when all the cars which have made non-stop runs will be examined by a technical committee of judges, who will apportion penalty points in respect of the "condition after trial" (*Konditions-prüfung*) of the engines and chassis.

Any faults detected will be penalised with points under three categories as follows:

FIRST CATEGORY.—Melted crank bearing, 100 points; broken parts affecting the running of the engine, 25 points; a broken frame, 50 points; broken brake rod, 50 points; faulty gear, 25 points; broken main spring leaf, 5 points.

SECOND CATEGORY.—Faulty ignition and cylinders missing, 10 points; engine failing to start within three minutes, 5 points; lost or disorderly parts of engine, 5 points each; leaky radiator, 5 points; broken fan, 2 points; bent axle, 20 points; bent steering, 25 points.

THIRD CATEGORY.—Lost or disorderly parts of engine that may affect the running, 5 points; lost or disorderly parts of the chassis, 5 points.

By a process of sifting, therefore, it is hoped that one car will stand above its fellows in point of merit, and that it may be returned as a sole winner. In the case of a tie the judges will decide the issue.

On going through the regulations *seriatim*, and comparing them with those of 1912, I find other new conditions as follows:

Each car must be provided with a reliable speedometer.

Only one observer will be allowed for each car, and he must give

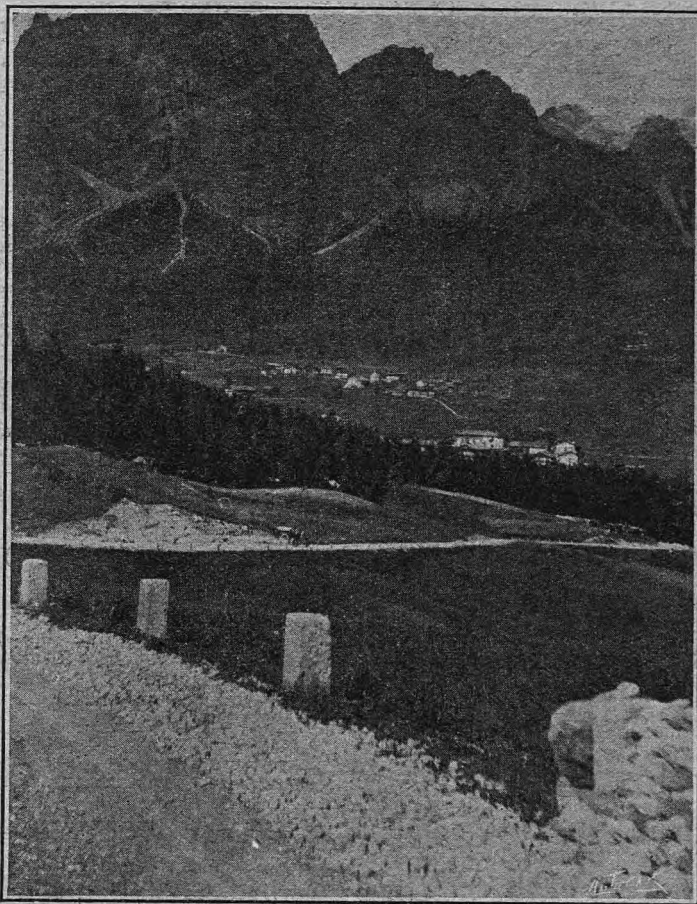
sufficient proof before selection of a sufficient knowledge of motoring matters.

To every car will be prescribed an average speed, according to its horse-power, and this average must be maintained.

Passing will not be allowed unless the speed of the car in front falls below forty-five kilometres an hour.

For the rest it may be stated that the awards of penalty marks on the road, as apart from the judging of the non-stop cars for "condition after trial," will be on a triple system as last year. In the first place, all the cars will be penalised as follows in Class A.

1. One point for every minute of stoppage.
2. One point for every minute, or part thereof, in excess of ten minutes required for starting preparations.
3. Five points for the loss during the running day of any one of the seals, even when no repairs ensue.



The last mile of the Falzarego Pass into Cortina.

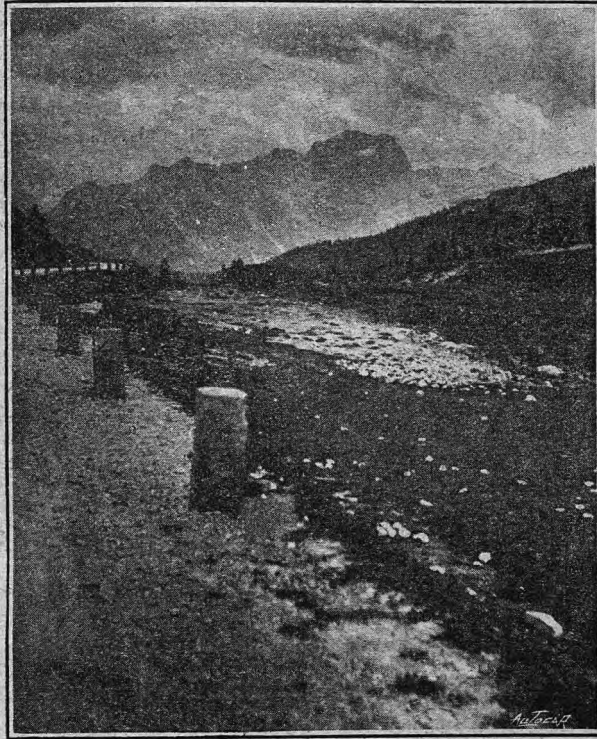
The Great Alpine Contest.

4. Ten points for each replenishment of the radiator on the road.

5. Three points for every minute, or part thereof, of interruption of the drive (stopping or running backwards) on the hills.

Cars which are bracketed equal under Class A will be further eliminated under Class B, the penalties in which are as follows:

1. One point for each minute or part thereof in excess of five minutes required for starting.



Another view on the Falzarego Pass.

2. Three points for each involuntary stoppage of the engine, provided it is restarted within a minute. This is to be additional to the penalty incurred in A5.

If equality still exists among remaining cars, a further weeding out will be made under Class C as under:

1. One point for each minute or part thereof in excess of one minute required for starting.

2. Five points for the loss or removal of any seals previously to starting, even if no repairs are made.

3. One point for each part of a minute required during the day's run to fill oil or petrol tanks, in so far as for this operation the stoppage of the car or the changing of seats by the passengers should become necessary.

4. Three points for every minute or part thereof of delay in the arrival of driver or passengers at the start.

The idea which was so prevalent at one time, but which is gradually being undermined by hard facts, was, to the effect that sleeve valve engines could not be driven at high speeds of revolution. The other day we had the Argyll demonstration of the fact that this alleged inability to "go round" did not exist; indeed, this is pretty conclusively proved by twenty-eight hours at an average of 74½ miles an hour, and this is what the two fourteen-hour performances of

All the foregoing penalties are in respect of stoppages of the car only. If the engine is also stopped the penalties will be doubled.

It will be seen, therefore, that before the ultimate winner is announced a considerable amount of eliminatory work will have to be undertaken—first by comparison of the observers' records, and secondly by the judges' examination of the cars which have emerged equally from the penalty markings in the three classes.

The following is a complete list of the names of the entrants and of the cars, with particulars of the engine dimensions:

Entrant and car.	Bore and stroke.
Archduke Josef Ferdinand (Puch)	85 x 125
Hans Newikluf (F.I.A.T.)	95 x 130
Dr. B. von Bleichröder (Minerva-Knight)	124 x 150
Count Alexr. Kolowrat (two Laurin and Klements)	
Count Paul Draskovich (Laurin and Klement)	95 x 150
*Rolls-Royce, Ltd. (three Rolls-Royces)	114 x 121
Jas. Radley (Rolls-Royce)	114 x 121
M. Schneemeiss (F.I.A.T.)	80 x 130
Karl Köhler (Hansa)	96 x 130
Miss Hélène Morarin (Puch)	85 x 125
K. von Guillaume (Mercedes-Knight)	100 x 130
Hans Freiherr von Malberg (F.I.A.T.)	80 x 130
Franz Quidenus (Minerva-Knight)	124 x 150
Minerva Motors, Ltd. (Minerva-Knight)	124 x 150
Direktor A. Sporkhorft (Hansa)	96 x 130
Ludwig Schild (Coventry Knight-Daimler)	
Alfa Works, Milan (Alfa)	124 x 130
Herr Roloff (Hansa)	88 x 140
Direktor Klinkosch (Minerva-Knight)	124 x 150
Dr. E. E. Lehwess (Fischer)	85 x 120
Fischer Auto Gesellschaft (Fischer)	85 x 120
*Dr. R. Stoess (Horch)	100 x 150
*Heinrich Paulmann (Horch)	100 x 150
*Georg Paulmann (Horch)	100 x 150
O. von Schmeling (Hansa)	88 x 104
Oberingenieur H. Luksch (R.A.F. Knight)	
*Direktor August Horch (Audi)	90 x 140
*Oberingenieur Lange (Audi)	90 x 140
*Ingenieur Graumüller (Audi)	90 x 140
Louis Obruba (Audi)	90 x 140
Robert Siercke (Austro-Daimler)	90 x 140
Prince Elias von Parma (Austro-Daimler)	
Franz Fuchs (W.A.F.)	94 x 160
Josef Piwonka (S.C.A.T.)	100 x 150
J. R. Parijs (Hansa)	88 x 104
Archduke Heinrich Ferdinand (Puch)	85 x 125
Robert Dollfus (6-cyl. Delaunay-Belleville)	
Count Karl Eugen Lamberg (Puch)	85 x 130
E. Quoika (Puch)	85 x 125
Fischer A.-G. (Fischer)	85 x 125
Walter Delmar (Benz)	95 x 140
Hans Suppan (R.A.F.-Knight)	100 x 150
S. Schreiber (Renault)	90 x 140
Hungarian Waggon and Machine Works (Raba-Wagen)	
	90 x 150

*Entered for team prize.

The following gives the number and makes of cars representing the different nations:

Germany (14).—Hansa, Mercedes-Knight, Horch, Audi and Benz.

Austria (11).—Puch, Laurin and Klement, Austro-Daimler, and W.A.F.

England (5).—Rolls-Royce and Silent-Knight Daimler.

Italy (5).—F.I.A.T., Alfa, and S.C.A.T.

Belgium (4).—Knight-Minerva.

Switzerland (3).—Fischer.

France (2).—Delaunay-Belleville and Renault.

Hungary (3).—R.A.F., Knight, and Raba-Wagen.

the Argyll average out at. Then there is the performance of the Knight-Mercédès at Indianapolis in the 500 miles race. This car had a 100 x 130 mm. four-cylinder engine. It was not only the smallest of any in the race, but it finished fifth, eight minutes behind Guyot's Sunbeam, and its average rate of revolution throughout the 500 miles was 1,658 per minute, giving it an average speed for the full distance of over 68 m.p.h.

Road Tarring Operations.

Official Information supplied by County Surveyors.

BY the courtesy of the county surveyors of England and Wales, we are enabled to publish the following preliminary list of tarring operations to be undertaken in the near future, and we propose to publish weekly similar information while road tarring is in progress.

To be forewarned is to be forearmed, and by casting their eyes over these pages week by week readers will be able to avoid the roads specified while they are actually under treatment.

It must not be forgotten, however, that the work of road tarring is in a large measure dependent upon the weather; indeed several surveyors have pointed out that the information they supply must be taken as being subject to this condition.

Then, of course, it does not necessarily follow that, because a road has just been tarred, it cannot be driven over without injury to tyres or car—some roads are bad enough in all conscience, but every county must not be tarred with the same brush. The roads in some districts, through being tarred judiciously and plentifully sprinkled with sand or other suitable gritting, are usable almost immediately after tarring operations are completed, and in sending their particulars some of the surveyors have drawn attention to the methods they adopt in order to cause motorists and other road users as little inconvenience as possible. For instance, Mr. E. Vaughton, the county surveyor of Merioneth, writes: "All our tar-spraying is done under pressure at a very high temperature and afterwards given a heavy dressing of granite chippings; consequently it is at no time troublesome to motorists. Our tar macadam work is also carried out in such a manner as to cause as little inconvenience as possible;

at no time are more than twenty to thirty yards laid without being rolled."

Mr. E. P. Hooley, the county surveyor of Nottinghamshire, who was one of the pioneers of good roads in this country after the introduction of motor traffic, states that the County Council of Notts do not tar-wash their roads; the work of permanent road construction is carried out by the use of Tarmac, and in no instance is the whole road occupied by the process of laying this material.

Mr. J. A. Bean, county surveyor of Northumberland, writes: "We are laying this year over 60,000 tons of tar macadam which offers no inconvenience to motorists, as only one-half width of the road is executed at a time, and when laid is in perfect order. Where the work is being carried on it is lighted at night. We do no tar painting of roads in our county."

Mr. E. S. Sinnott, county surveyor of Gloucestershire, tells us that in Gloucestershire every possible effort is made to ensure the comfort and convenience of users of the highway when tarring or repairs to the roads are being carried out, while Mr. J. E. Blackwall, county surveyor of Cambridgeshire, bears motorists and other users of the highways in mind to the extent of publishing every Monday morning in one of the Cambridge garages the probable positions of steam rollers during the week, and in other ways.

These are a few extracts taken haphazard from the letters of county surveyors which have already come to hand. It should be noted that quite a number of counties have not yet adopted tarring on any portion of their main roads, whilst the roads in some districts have already been tarred for the present year.

Roads under Treatment at Present or in the Near Future.

BUCKINGHAMSHIRE.

AYLESBURY, WENDOVER, AMERSHAM, AND UXBRIDGE.

—Between Wendover and the London and Oxford Road, near Redhill. Work commences on June 23rd, and will be completed in about a fortnight, weather permitting. Roads tarred half width at a time.

CAMBRIDGESHIRE.

NEWMARKET-CAMBRIDGE ROAD.—Till June 21st.

ROYSTON-CAMBRIDGE ROAD.—Till June 21st.

CARMARTHEN (WESTERN DIVISION).

LLANELLY-BURRY PORT ROAD.—Till June 21st.

CARMARTHEN - NEWCASTLE EMLYN ROAD.—At Conwyl till June 21st.

CARMARTHEN-ST. CLEARS ROAD.—June, 23rd till July 12th.

LLANELLY-PONTYEALES ROAD.—Till June 26th.

DORSET.

At the villages of Stalbridge, Sturminster Newton, Shillingstone, and Durweston till June 25th.

At Gorfe Castle, Sandford, Bere Regis, and Lytchett Minster till June 28th.

At Blandford, Spettisbury, Kinson, Longham, and Broadstone till June 28th.

DORCHESTER-WEYMOUTH ROAD.—At Upwey and Broadwey till June 28th.

WAREHAM-LULWORTH ROAD.—At Wool from June 30th till July 1st.

FLINTSHIRE.

RHUDDLAN-ST. ASAPH ROAD.—Till June 21st.

CHESTER-ST. ASAPH ROAD.—The road between Northop and Holywell will be under reconstruction for the next few months.

GLAMORGAN.

CAERPHILLY-LLANBRADACH ROAD.—Till June 21st.

SWANSEA VALLEY ROAD.—At Morrision and Clydach till June 21st.

ABERAVON-NEATH ROAD.—At Aberavon till June 21st.

NEATH-SWANSEA ROAD.—At Skewen and Llanhamlet till June 21st.

HEREFORDSHIRE.

HEREFORD-ROSS-ON-WYE ROAD.—At Llandinabou, halfway between Hereford and Ross, till July 7th.

ISLE OF ELY.

ELY - MARCH - PETERBOROUGH ROAD.—Doddington village till June 21st.

CAMBRIDGE-ELY ROAD.—Near Stretham village till June 21st.

ISLE OF WIGHT.

FRESHWATER-CHALE ROAD.—Brighstone, Shorwell, and Chale till June 27th.

SANDOWN-BEMBRIDGE.—At Bembridge till June 30th.

Road Tarring Operations.

KENT.

BROMLEY-WESTERHAM ROAD.—Westerham end till June 21st.

DARTFORD-FARNINGHAM ROAD.—Till June 21st.

DOVER-FOLKESTONE ROAD.—Till June 21st.

SANDWICH-DEAL ROAD.—June 23rd till July 14th.

CANTERBURY-DOVER ROAD.—June 23rd till July 14th.

MAIDSTONE-SEVENOAKS ROAD.—Till July 1st.

SARRE - BIRCHINGTON - MARGATE ROAD.—Till July 7th.

CANTERBURY - SARRE - RAMSGATE ROAD.—Till July 15th.

DOVER-DEAL ROAD.—Till July 21st.

WESTERHAM-SUSSEX ROAD.—Till July 31st.

FAVERSHAM-CANTERBURY ROAD.—Near Boughton-under-Blean till June 28th.

QUEENBOROUGH-SHEERNESS EAST.—Near Queenborough till June 30th.

KEY STREET BOBBING-KING'S FERRY BRIDGE.—Till June 30th.

MAIDSTONE-CHATHAM ROAD.—Till July 12th.

HYTHE-ROMNEY ROAD.—Till June 30th.

LINCOLNSHIRE (HOLLAND).

SUTTON-ST. JAMES'S ROAD.—Till June 21st.

GEDNEY HILL.—From June 22nd till June 24th.

SPALDING-GRANTHAM ROAD.—Till June 30th.

SLEAFORD-KING'S LYNN ROAD.—July 1st till July 4th.

LINCOLNSHIRE (KESTEVEN).

LINCOLN-GRANTHAM ROAD.—Syston and Barkston till June 21st.

GRANTHAM-STAMFORD ROAD.—Till June 28th.

BOURNE-MARKET DEEPING ROAD.—Till June 26th.

MERIONETH.

TOWYN-DOLGELLEY ROAD.—Llwynguril and Arthog till June 28th.

BARMOUTH - PORTMADOC ROAD.—Talsaman and Llanbedr till June 28th.

BLAENAU-FESTINIOG TOWN.—Tar macadamising till July 19th.

HOLYHEAD ROAD.—Tar macadamising at Corwen Town till July 26th.

MONTGOMERYSHIRE.

OSWESTRY-LLANFYLLIN ROAD.—In the villages of Llanymynech and Llansantffraid till July 8th.

WELSHPOOL-NEWTOWN ROAD.—Tar macadamising expected to commence in July and to be continued for some time.

NORFOLK.

LONG STRATTON.—Nor-Scole Road till June 23rd.

STAFFORDSHIRE.

DAWLEY BROOK-MORDSLEY ROAD.—Till June 21st.

STAFFORD-STONE ROAD.—At Yarlet Bank, four miles from Stafford (Tarvia), from June 21st till 27th.

STAFFORD-NEWPORT ROAD.—At Gnosall, 7½ miles from Stafford, from June 23rd till June 25th.

STAFFORD NEWPORT ROAD.—At Haughton, 4½ miles from Stafford, from June 26th till June 27th.

UTTOXETER-NEWCASTLE ROAD.—At Blyth Bridge, from June 23rd till 26th.

BURTON-ABBOTS BROMLEY ROAD.—Top of Henhurst Hill, 2½ miles from Burton-on-Trent (Tarvia and loose metal), from June 23rd till 28th.

BRANSTONE VILLAGE.—Till June 24th.

BARTON TURNS.—Till June 25th.

BARTON-UNDER-NEEDWOOD.—From June 26th till June 28th.

UTTOXETER-NEWCASTLE ROAD.—In Tean Village, from June 27th till 30th.

SUFFOLK, EAST.

IPSWICH-LONDON ROAD AND BRAMFORD-SPROUGHTON ROAD.—Till June 23rd.

WRENTHAM-LOWESTOFT ROAD.—Between Kessingland village and Kessingland Dam from June 23rd till 28th.

IPSWICH-NORWICH ROAD.—Between Thwaite and Scole from June 23rd till 28th.

BRAMFORD STREET-WOOLVERSTONE ROAD.—Till June 24th.

STOWMARKET-BATTISFORD ROAD.—Till June 25th.

NEEDHAM MARKET-STOWMARKET ROAD.—From June 25th till 28th.

DISS-BURY ROAD.—From June 23rd till 28th.

WILTSHIRE.

MALMESBURY - TETBURY ROAD.—At Sherston, Luckington, Corston, Crudwell, and Somerford till June 28th.

RAMSBURY - HUNGERFORD ROAD.—At Chilton, Ramsbury, Aldbourne, and Bedwyn, completion expected June 28th.

TISBURY-SHAFTESBURY ROAD.—At Ludwell and Tisbury till June 28th.

TROWBRIDGE.—At Southwick, Bradley, Yarnbrook, Hilperston, and Semington till July 6th.

WORCESTERSHIRE.

REDDITCH-EVESHAM ROAD.—Commencing at Crabbs Cross, and continuing for a distance of four miles towards Evesham. Till July 7th.

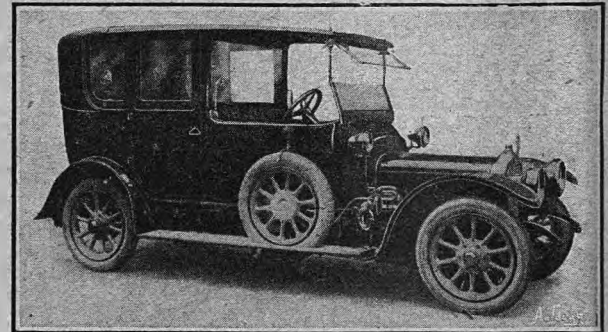
STOURBRIDGE - BROMSGROVE ROAD.—Commencing near Stourbridge, and continuing for a distance of about four and a half miles towards Bromsgrove. Till July 2nd.

YORKSHIRE (NORTH RIDING).

THIRSK-YARM ROAD.—Work in progress near Thirsk, which may last for several months.

YORK-MALTON ROAD.—Work in progress near Barton Hill, which may last for several months.

NORTHALLERTON-HAWES ROAD.—At Morton and near Bedale till June 21st.



A 15 h.p. Talbot limousine-landaulet body with a new domed roof by Messrs. Brainsby and Sons, Long Acre, London, W.C. This body has been built to the order of Mr. A. Oddenino, the well-known restaurateur, of the Imperial Restaurant, Regent Street, W. It is finished in dark green with black lines, and the wheels are in primrose picked out in black. The interior is upholstered in drab corded cloth and fitted with the usual appointments. The car is fitted with Talbot detachable wheels, a Rotax electric lighting set, Autovox power and Lucas bulb horns.

Notes upon Tar Treatment of Road Surfaces.

Supplemented by Hints on Pot-hole Repairing.

THE following notes have been issued in the form of a pamphlet by the Roads Improvement Association, 15, Dartmouth Street, Westminster, S.W. All motorists who are dissatisfied with the way in which tarring has been carried out in their own districts are invited to bring these notes to the notice of their local surveyor. They can obtain copies from the Roads Improvement Association at the price of one penny per copy.

The Roads Improvement Association is continually receiving complaints, from all classes of road users, of unsatisfactory results obtained from road tarring work. A careful investigation of these reports indicates that in most instances the unsatisfactory results complained of have occurred in consequence of the non-observance of elementary principles in road tarring work. The Association has, therefore, drawn up the following suggestions to help those actually engaged upon road tarring operations, in the hope that they will be of assistance to them. The suggestions apply in the main to surface tarring only, but the underlying principles apply to some extent when tar and bituminous compounds are used for deeper treatment in the reconstruction of the road crust itself.

Suitability of the Road for Tar Treatment.

To obtain good and lasting results from the surface treatment of carriage-ways with tar and bituminous compounds it is absolutely necessary to be quite satisfied that the crust and foundation of the road, taken together, are sufficiently strong to carry the traffic that may reasonably be expected to use it.

Unless the road is able to carry the traffic, it is much better to spend all the money available upon strengthening the road itself and to postpone tarring work. If tar is applied to a weak road the surface breaks up very quickly and the resultant dust and mud are more annoying to users than if the road had not been so treated.

Preparation of Surface.

A road surface should not be treated with tar until it has been thoroughly cleansed from dust, caked mud, and dung; a number of special brushes are now made for this purpose. It is very important that particular care should be taken to remove the dust, caked mud, and especially dung from all crevices, etc.; if it is not so removed the tar will not adhere properly to the road surface.

Assuming that the road is sufficiently strong to carry the traffic, the whole of the surface of the carriageway, from verge to verge, should, during the winter or spring preceding, be made true and even, and before any surface tarring is commenced the road crust must be quite dry. To take out pot-holes, ruts, and similar irregularities in the surface, peck round them and remove the worn granite and other material to a depth of 1½ in. to 2 in. to secure an ample key and body to the patch; carefully brush the hole over with hot tar and fill in with previously tarred 1½ in. to ¼ in. graded material, using the greatest care to ram solid. The patch should be so finished that it is not more than ¼ in. higher than the adjacent surface of the road, to allow for shrinkage and further consolidation under traffic. If this course is carefully followed, the patch quickly becomes level with the surrounding surface.

If a patch is finished so that it sets *above* the surrounding level, the fact that it is harder than the road itself causes traffic to bump upon it both ways; excessive wear takes place on both sides as a consequence; other holes form around it, and the road becomes so bumpy as to be almost unrideable. If the patch is finished *below* the surrounding level traffic quickly wears down the edges of the road around it, the tar painting breaks away and allows the penetration of water.

Under no circumstances whatever should an attempt be made to apply tar or similar compounds to road surfaces until the road is thoroughly dry to a point at least half an inch below the surface. The slightest damp means absolute failure. Often a surface appears to be sufficiently dry, but a careful examination should be made below the upper surface to make certain. Hot tar will not penetrate a damp road, nor will it adhere to damp road metal. Tar applied to a surface not thoroughly dry merely forms a skin which quickly denudes or detaches itself under the action of traffic, forming objectionable tarry dust or mud. Further, the road itself, being robbed of its natural means of surface evaporation,

remains damp and therefore rapidly decomposes under the waterproof skin, which soon breaks up and ceases to keep out the water. It is quite impossible for roadmen to cope with the tarry mud that forms, as if by magic, soon after the first autumn rains, and continues throughout the winter consequent on tar being applied to a road that was even slightly damp. Not only is this tarry mud a source of inconvenience and annoyance to road users and roadside dwellers, but it also facilitates inter-attrition between the stones of the crust of the road and thus increases the wear, so that, instead of a saving being effected from the use of tar, the ultimate cost of the maintenance of a road thus badly tarred is materially increased.

Under ordinary circumstances, with light and medium traffic, a road surface that is sufficiently strong to carry heavy vehicles without rupture of its crust, that has been rendered true and even, and afterwards, when thoroughly dry, carefully tar treated, may be expected to remain good throughout the whole of the first summer season and be in relatively fair condition at the end of the following winter, and then only to require a very light coating of tar for the next treatment.

Kind of Tar to be Used.

Great care should be exercised in the selection of the tar to be used. The various proprietary tar compounds are mostly well distilled and satisfactory, and are all guaranteed safe for use in proximity to fishing streams or ponds. Crude coal tar, however, requires special care, as it contains ammoniacal liquor, and other constituents that are not only useless to the road, but, being soluble in water, will pollute streams or ponds into which the road washings might discharge.

Most gasworks are now equipped with a dehydrating plant, and are thus able to extract the dangerous ammoniacal liquor and some of the lighter oils, phenolic bodies, and naphthalene from the tar before they supply it to the consumer. A fair tar should weigh about 12 lbs. per gallon at about 60°F., and should contain no ammoniacal liquor. Many, if not all, of the defects of ordinary gasworks tar, so far as road work is concerned, may be removed if the tar is well boiled. Crude tar should therefore not be used immediately it reaches boiling point, but should be maintained at the boil for a considerable time before applying it to the road. This should only be done under proper supervision: when open vessels are used great care should be exercised to see that the tar does not boil over.

Application to the Road.

The methods of application, whether distributed with a hand broom or by mechanical sprayers, are not commented upon here; opinions vary as to which is the more efficient. Great care should be taken to apply only that quantity of tar to the road which it will readily take and at the same time amply cover the surface; this quantity usually lies between one-sixth and one-fourth of a gallon of tar per square yard of road surface. Any surplus tar which collects in puddles should be removed at once; if this is not done the surface becomes troublesome at these points on hot sunny days, and much annoyance is caused to the public.

Wherever local circumstances permit, the freshly applied tar should be allowed time to sink into the road surface and slightly to harden before traffic is turned on, or any sand or grit is applied. This is best attained by treating one half of the width at a time and going back to the starting point to commence the second half-width.

The gritting should be one half sharp sand and one half larger grit, the grit not to exceed ½ in. Sand and flint grit are the cheapest and most efficient gritting material. When granite chips are used they should be very small, none larger than ¼ in.—the smaller is preferable. Where slag dust is available it is a valuable material to use and it forms a durable skin.

With sand or flint gritting no rolling is necessary. When granite chippings or other hard material is used, however, it helps to produce a durable skin and to incorporate the material with the original road surface, if, a few hours after the chippings have been applied to the tarred surface, a roller is passed over it.

"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.

The Grand Prix of America Motor Race.

Some Points of Contrast and Interest. By H. Massac Buist.

INDIANAPOLIS, May 30th, 1913.

NOT the least interesting of the hundred and one novelties which our American hosts have arranged to show the members of the Institution of Automobile Engineers now visiting their country is the 500 mile race on the square track at Indianapolis, which commenced at ten o'clock this morning and ended at half-past four in a victory for Goux on a Peugeot car, in a hotly contested competition witnessed by the record crowd ever assembled at a meeting of the kind in America, and consisting of considerably over 90,000 spectators, every one of whom had paid at least 8s. to get into the grounds. There were eight and twenty starters for a prize list of over £10,000, divisible between the first ten cars to get home, apart from several trophies. The competition took place under the governance of the American Automobile Association, which is to motor racing what the National Baseball Commission is to the greatest of all American sports. No man is allowed to drive a car, either as principal driver or relief, until he has demonstrated possession of sufficient skill to warrant the granting of a licence for him to do so. The cars that ran to-day are limited to 450 cubic inches engine volume, each machine having been put through a qualifying test a few days previously, and carefully examined by a technical committee. This is the fourth year in which a big competition of the kind has been conducted at Indianapolis, hence the details of organisation are alike elaborate and comprehensive.

Half an hour before the start of the race the competing cars were paraded and made to sprint down the straight, when official observers noted the application of the brakes to be sure that all should be in order. Though the track occupies an area of 328 acres, the course being two and a half miles to the lap, each of the quarter turns to the square is of only 840 feet radius, and no attempt whatever is made at providing parabolically curved bankings, such as we have at Brooklands. Instead, each of these quarter turns at the corner of the square track is an embankment sloping to the extent of sixteen feet only, and protected on the outside by a cement wall three feet high and eleven inches thick, the surfacing being

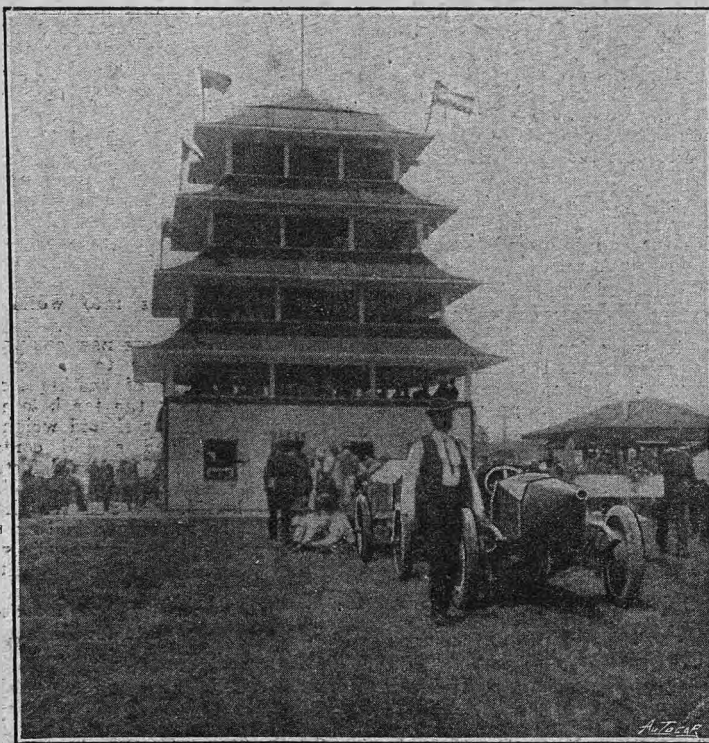
of vitrified, otherwise glazed, brick. It was originally a cement track. There are more than forty buildings in the enclosure, including grand stands, garages, machine shops, storehouses for supplies, refreshment and office buildings. The grand stands have a seating capacity of 6,000, and are distributed about the flat track in such a way that the individual spectator can see at least three-quarters round the track no matter where he may be situated. He can see the competitors taking one of the corners exactly in front of him; and taking two other corners away from him. From the better seats it is possible to see quite around the

track. The charge for admission to the grand stands is additional to the entrance money into the motordrome, the seats averaging something like two pounds each. But here, in contra-distinction to anything we have either on road or track in Europe, practically the whole of the race takes place in front of the eyes of the individual spectator. The cars pass him so close that he realises the speed at which they are travelling. Moreover, the individual driver has very much more to do on the track in Indianapolis than he has on Brooklands, where he has practically to test merely engine efficiency and suspension. At Indiana-

poli the speed of the car has to be constantly changed, the engine has to be shut off at least four times every lap, and the brakes applied as often, with the result that a very high premium is put on acceleration; also steering.

For the start the cars are lined up in rows of five. The track is only forty feet wide along the straight, and is only sixty feet wide at the bankings. They have one run around behind a pilot car, the race proper beginning with a flying start at the end of the first lap.

Half an hour after the commencement of the contest men stationed at each corner commenced dexterously to cast chloride of lime on to the surface. They continued to do so in nimble fashion, dodging the cars, throughout the remainder of the race. The track hereabouts shows up black, the surface being rendered treacherously slippery with lubricating oil deposited through the sudden shutting down of the engines, followed a few seconds later by the opening of them up as the cars get away again on to the



The Indianapolis Race. The combination pagoda for the accommodation of the judges, timekeepers, telegraphists, and the press.

succeeding stretch of straight. Most of the drivers begin to accelerate half way around each bend. The contest had gone but a short distance when one realised the disadvantage of the French drivers at this sort of work. They took their corners in quite a different fashion from the American experts, and, though Guyot, handling the Sunbeam, is understood to have done a lap in practice at eighty miles an hour, never throughout the day was that two-year-old car put to the top of its performing by him. Indeed, the further the thing proceeded the more one gathered the impression that he was driving to finish, not to win.

Under this heading I must perforce read a friendly lecture to the Sunbeam people, as a piece of advice not only to themselves, but also of benefit to British manufacturers in general, who are not acquainted with the American conditions. The Sunbeam car started in this race first favourite. Everybody in America imagined it had been officially entered by the firm. I had scarcely landed in New York before one of the most prominent dealers told me that if the car would win the race he would place a firm order, with deposit, for 500 Sunbeam cars, no matter whether the present duty were reduced or not. The American motor public loves a winner, and does not mind what its country of origin. I found it impossible to convince most of my friends out here that the car which has a reputation in the United States equal to anything it has been enjoying in Europe was being run as a private entry. They wanted to know what the Sunbeam Co. was doing not to take America seriously! Of all the replenishment pits, the Sunbeam one was practically the only one without any adequate organisation for telling the driver how he was progressing in the competition in relation to his rivals. Apart from spare wheels and tyres, as well as fuel and water, there was no preparation for dealing with any case of breakdown. The car only changed one tyre throughout the run, which is an enormous tribute to the Dunlop tyre. Precisely how much can be realised only by those who have actually witnessed the wholesale manner in which tyres were disintegrated throughout this competition, long strips peeling off and flying high into the air. The corner work on the track scrapes them to an extraordinary extent. Under this heading it is particularly interesting to note that Goux used a tyre of half an inch less diameter on the left, or inside, front wheel than on the right. The comparative good fortune he had with his pneumatics must be held to have fully justified him in making this departure from the orthodox way of doing things.

The Sunbeam car was leading at the end of the first fifty miles, with Burman on a Keeton a very close second. But it was plain the competitors had not got going properly by that stage. The prompt manner in which the position of the leaders of the competition was announced by megaphones all over the ground throughout the day is something far in advance of anything we have in Europe. On the other hand, there is no big scoring board on which is set out the lap times, or, indeed, any other times, for every competitor in the race during its progress. There is, instead, merely a single row of numbers representing each competitor, with a board below bearing a number corresponding to the total laps he has travelled in the competition. One man looks out for each competitor in this connection. You therefore get an impression of the progress of the race rather in terms of laps than of time.

The Grand Prix of America Motor Race.

Another strange impression was to see a number of the cars with steering wheels on the opposite side to those we employ in Europe. The cars kept flashing by throughout the day to the extent of quite half a dozen a minute. Though breakdowns were considerably frequent, the fact that well-nigh all the racing could be seen by any individual spectator resulted in there never being a dull moment from start to finish. Time and again I was struck by the demonstrations and excitement in the various stands. It revealed that the spectators as a body realised precisely what was the given point of interest in the competition at whatever moment might be in question—an extraordinary contrast with European conditions, where the average spectator has not the slightest idea of the relationship in which the competitors stand to one another at any particular point in the contest. Here, in fact, for the first time is motor racing made interesting, because intelligible to the lay mind. There is, for example, nothing strategically so absurd as the hill at Brooklands, whereby the only time the cars come anywhere near the average spectator they are practically out of sight!

While tyre troubles were to be expected in plenty, something quite fresh to our European experience was furnished in the frequency of magneto failures. It appears that this is quite one of the commonest causes of breakdown in motor races of this character in America. It is suggested that the temperature of the weather accounts for this. That, however, can scarcely be so in face of the fact that I have seen many long distance motor races in Europe run on very much hotter days than this has proved to be.

At the end of the first hundred miles Burman was leading by an excellent margin on the Keeton car in 1h. 15m. 50s. At 200 miles, however, Goux had leapt to the front on the Peugeot in 2h. 33m. 40s., otherwise at a mean speed of 77.43 m.p.h., for Burman had broken down and lost over an hour in the competition, in consequence of which he changed his carburettor with the idea of making the fastest lap of the day, which he easily did at 85 m.p.h. At this period Anderson, on a Stutz, was lying second, and the Sunbeam third. Thus Goux, on the Peugeot, carried the Remy Grand Trophy and the Brassard Trophy, value \$2,500, for the first car to finish 200 miles. As the event proved, he carried off all the other special trophies, for his lead was never eclipsed, so that he won the Prest-o-Lite Trophy, value \$2,500, for being the first car to finish 300 miles, as well as the Wheeler and Schebler Trophy, value \$10,000, for being the first car to finish 400 miles, and \$20,000 in cash for winning the 500 mile race on a Peugeot car with Rudge wire wheels and Claudel carburettor.

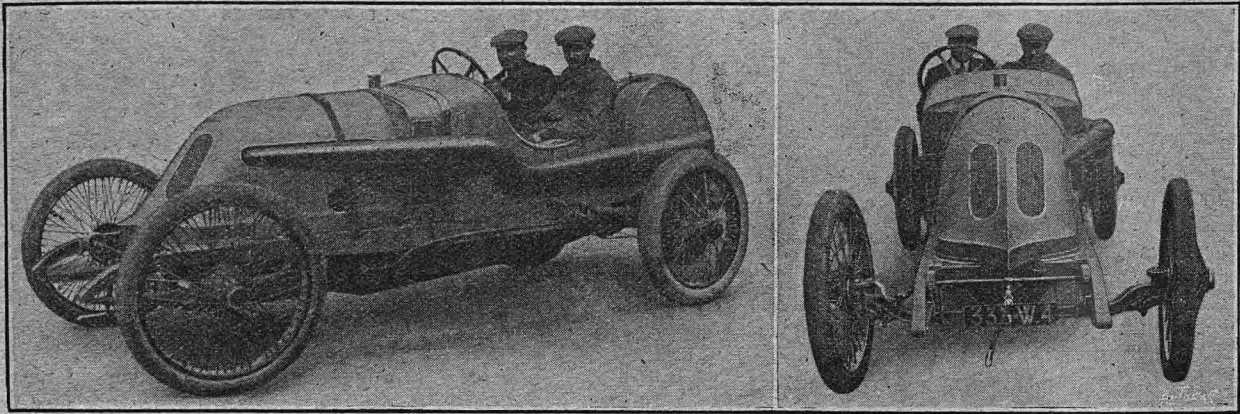
Our hosts were exceedingly kind not only in offering to show us everything concerned with the organisation of the race, but also in insisting that we should make good use of the invitation. Thus they took us to the top of a five-storey pagoda fashioned of wood, where the telegraphists occupy the ground floor, the press the first and second floors, the timekeepers the third floor, and various officials and visitors the top floors. Here we had a perfect panorama of the entire race-course, gleaned a fine idea of the huge concourse of people, saw the overhauling at the turns more clearly than ever, admired the agile way in which the men rushed in and out casting chloride of lime between the passing of the cars, and studied the special system of electric timing, which calls for the services of many more men than we employ at Brooklands. The

The Grand Prix of America Motor Race.

apparatus is quite different from Colonel H. C. L. Holden's narrow tape. For one thing, it has to be designed to be fairly portable. As the cars pass over the line an electrically operated stamper imprints the hours, minutes, seconds, and hundredths of seconds transversely on a broad paper ribbon. It is one man's duty to watch the number of each car over the line and to shout through a megaphone to those in

will have to spend the time recovering. Both of them lay in such a position that they could see the progress of the racing. One of them seemed free from pain and was calmly smoking a cigar; the other was writhing all the time.

The rules allow of the taking on of emergency drivers and mechanics. Considerable advantage was taken of this on the part of those who were not

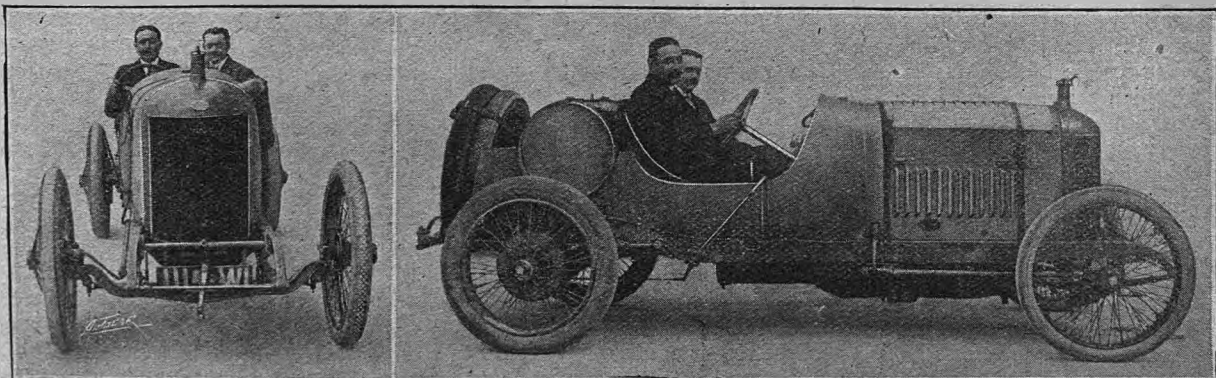


One of the four Schneider racing cars entered for the French Grand Prix. This one is to be driven by Thomas.

the timekeeper's box the given number, whereupon another man writes the number against the time register. Yet other men in other parts of the box verify the number of laps completed at the given time by the car in question, writing that upon a sheet. All these functions are quite distinct from the work of the circuit counters, one of whom is detailed to attend to a single car only. Further, in the timekeeper's box a check is kept by hand-operated watches, while the passage of the cars is further checked by mechanical adding machines, and information as to the score is officially flashed to the boards by telegraph.

After the first 200 miles, a Mason car skidded and overturned on the banking. Jack Tower, the driver, broke his right leg, and the mechanic, L. W. Dunning, was crushed and had his jaw broken. Happily, these were the only accidents that marred the proceedings. The ambulance arrangements were excellent, yet it struck me as somewhat remarkable that injured men were kept in the hospital tent on the grounds practically during the rest of the racing, instead of being removed promptly, as they could have been, quite away from the course by means of the subway to the quietness of the hospital where they

leading in the competition. But the Americans and Europeans who were going well continued in charge of their machines quite up to the finish of the race. The organisation at the pits was good, but, except for the tyre drill, it did not impress me as being quite so fast as in France. Nor has the system of signalling requirements been developed to a like extent. The pluck of the drivers and their mechanics in going on in spite of breakdowns struck me as being on a higher average than I have ever seen. The tyre troubles were quite as frequent as the almost record number experienced by the monster cars that figured in last year's Grand Prix Race in France. The American rule allows of five men being furnished to each pit in the case where a single car has been entered. For every additional car three more assistants are allowed. The men in the pit are allowed to feed water, oil, and petrol to the cars, and may help do the cranking, which is a very different arrangement from ours. The driver and mechanic have to do all in the way of mechanical repairs, but either or both may be changed during the progress of the race. Detachable rims, as well as the rims of detachable wire wheels, were bent and scraped quite often by the application of the



Front and side views of one of the two Delage cars to be driven in the French Grand Prix. This car is Bablot's.

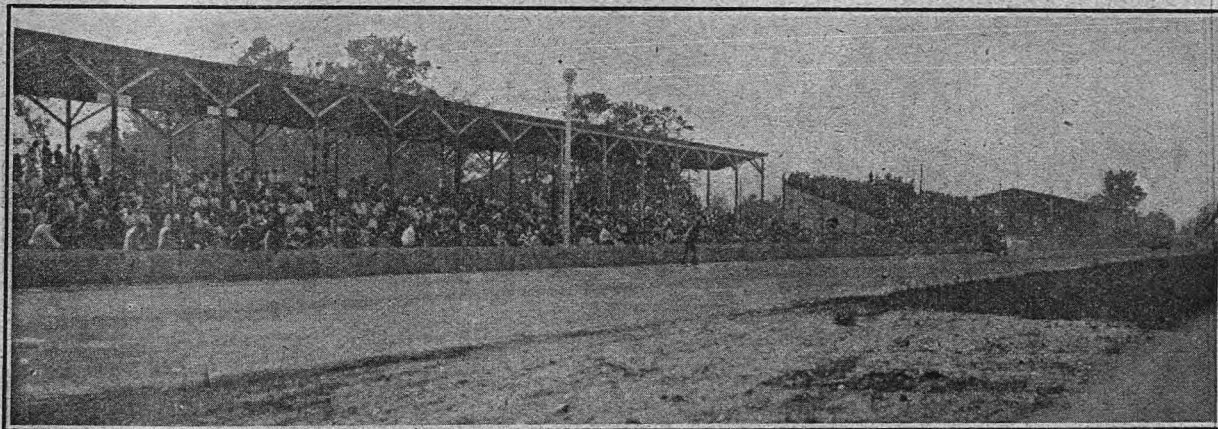
brakes when drawing up to the depot after experiencing either punctures or bursts, the latter being of quite frequent occurrence.

Goux's time for 400 miles was 5h. 9m. 53s., so that the running throughout was slower than last year's race. Anderson was still second on the Stutz Special, and the Sunbeam had fallen back to fifth place. This was the first race in America on the track in which foreign cars had been driven exclusively by foreigners, nor can any of them be said to have had appreciable track experience.

Some notion of the vast interest aroused may be had from the fact that no fewer than 11,000 privately owned cars were parked on the ground to-day. With eighty miles to go before the finish of the race, the grand stand became alive with excitement, a great contrast with the lack of understanding manifested in similar proceedings in the old world. This is the more remarkable in face of the fact that you cannot tell how much in point of time the second, third, and fourth cars may be behind either the leader or each other. A dramatic turn to the proceedings was given twenty miles from the finish when Burman had the ill-luck to break a crankshaft even while he was running a splendid second.

The Grand Prix of America Motor Race.

on a Stutz car, was an excellent third, but the Sunbeam, which ran like a watch, or a railroad train, throughout, was really never "extended" throughout the race. In consequence, it made relatively poor showing in securing fourth place, as you may gather from the fact that during the last lap the car practically toured round the course at a "legal limit" like speed, the organisation being so faulty that Guyot failed to realise he still had to race for a lap after seeing the green flag signal. Better luck than was his no man could have asked for, but he has yet to gain experience of track racing; hence the car which represented the British industry to-day has yet to be revealed in all its powers to the American public. My forecast that it ought to have been handled by an American expert at this highly specialised class of track racing is thoroughly justified. Considering Guyot's inexperience at this class of work, I accord him high praise; but on the point of policy, when it is a question of representing British products abroad, I beg to enter a protest. Let us either abstain from entering British cars in foreign competitions, or see to it that our cars are in every case given the very best possible chances, for if we do not take ourselves seriously, how can we expect other folk to do so?



THE AMERICAN GRAND PRIX: Goux on the winning Peugeot coming down the straight to the finishing line.

At 4.34 p.m. Goux passed the post on the Peugeot an easy winner, at two miles an hour less speed, however, than Dawson attained last year when he won on the National car at 78.7 m.p.h. A very fine thing about the proceedings, too, was the popularity of this foreign winner. Many of us can recall how in France on the occasion of foreign wins in big races the grand stands have been practically cleared before the victor has passed the post. Precisely the opposite procedure obtains in America. The first car was a French one, and an American victory could not have been more popular: everyone cheered the victor. Everyone waited to see the subsequent prize winners, too, in a race of so drastic a character that in spite of the teams entered no two cars of a type even finished the course. Well might the spectators be wildly excited about the race, even after the winner was home. The second was S. Wishart, on a Mercer car, which, when it had something more than two laps to go, broke a crankshaft and base chamber, and caught alight in front. The last lap but one was made in such slow time that everybody imagined Wishart had been fain to give up. Instead of that, however, he had done his best to quench the flames, but, finding it impossible, continued slowly to the finish. Mertz,

In conclusion, the results of the competition are set out in the following table:

Position and Driver.	Car.	Bore and Stroke.	Elapsed Time.		M.P.H.	Country.	Prize.
			h. m. s.	inches.			
1. Goux	Peugeot	4.4 x 7.2	6	41	43.45	France	\$20,000
2. Wishart	Mercer	4.37 x 5	6	45	6	U.S.A.	\$10,000
3. Mertz	Stutz	4 1/8 x 5 1/2	6	50	35.75	U.S.A.	\$5,000
4. Guyot	Sunbeam	3 1/2 x 6 1/2 (6 cyls.)	7	5	8.10	Britain	\$3,500
5. Pilette	Mercedes-Knight	3 1/2 x 5 1/2	7	19	25.55	Germany	\$3,000
6. Wilcox	Gray Fox	4 1/2 x 5 1/2	7	23	38.9	U.S.A.	\$2,200
7. Mulford	Mercedes (poppet)	4.4 x 7 1/8	7	27	17.85	Germany	\$1,800
8. Disbrow	Case	5.1 x 5 1/2	7	30	50.93	U.S.A.	\$1,600
9. Clarke	Tulsa	4 1/2 x 5 1/2	9	49	21	U.S.A.	\$1,500
10. Haupt	Mason	4 1/2 x 6	7	53	31	U.S.A.	\$1,400

They say here that a foreign victory is the finest thing that could happen for the track to ensure a really representative entry of cars for the race next year.

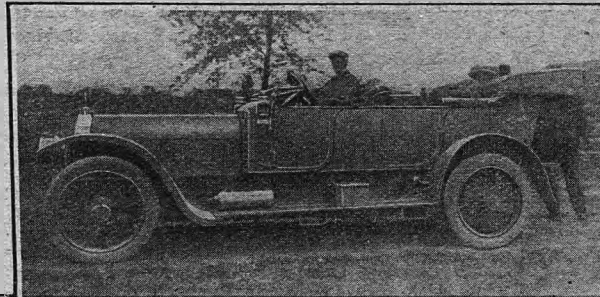
It has been decided by the Motor Traders' Association of New South Wales not to hold a motor exhibition this year. For the past two years shows have been held during October on the Agricultural Show Ground at Sydney, but although the exhibits were large, the attendance was small, and the results, therefore, did not justify the exhibits.

The First Hill-climb in Canada.

Honours for Wolseley Cars.

ON May 24th the first organised hill-climb held in Canada took place upon a hill near Hamilton, Ontario, known as the Strongman Mountain Road, under the auspices of the Hamilton Automobile Club and the Hamilton Motor Cycle Club. There were three motor car classes—(1) open to cars of 35 h.p. and over, (2) for cars under 35 h.p., and (3) cars of 26 h.p. and under. The hill was just over a mile long, and included three sharp turns.

In Class 1, Mr. A. Sharp, on a 30 h.p. six-cylinder Wolseley, won in 2m. 42s., Mr. W. Vallance on a 50 h.p. six-cylinder Hudson, and Mr. W. Gooderham on another Wolseley tying for second place in 2m. 46s.



In Class 2, Mr. A. Sharp on the 30 h.p. Wolseley won in 2m. 39s., the second being Mr. F. Johnston on a 16-20 four-cylinder Wolseley in 2m. 51s.

In the smallest class, Mr. W. R. Bennett, on a Russell, won in 2m. 51s., the second being Mr. F. Johnston on the 16-20 h.p. Wolseley in 2m. 53s.

The fastest time of the day was made on a six-cylinder 45 h.p. Pope-Hartford, driven by Mr. Coolican, the time being 2m. 38 $\frac{2}{5}$ s. As this car had only a light two-seater body, whereas the other cars entered were provided with heavy touring bodies, it was not placed in Class 1, but was awarded a special prize.



THE CANADIAN HILL-CLIMB. Above, the 30 h.p. six-cylinder Wolseley car, driven by Mr. A. Sharp of Toronto, which won in Class 1 of the Hamilton (Ontario) hill-climb. Below, a view of the Strongman hill, showing the nature of the road, and one of the competing cars rounding a corner.

The Legal Status of the Chauffeur.

A fortnight ago the County Bench at Canterbury (on which, by the way, Mr. R. T. Lang, the old cyclist and motorist sits) had a point to settle of particular interest to owners of motor cars who employ chauffeurs. Under the Employers' Liability and the Workmen's Compensation Acts it has never been decided whether a chauffeur is a domestic or menial servant or a workman. The Bench had to settle this point on a claim for wages and expenses by a chauffeur who had been dismissed for alleged incompetence. Counsel on both sides argued the case at great length, and the Bench decided that the chauffeur is not a domestic or menial servant, but a mechanic, basing their decision on one given by Mr. Justice Darling in the case of a motor 'bus driver. Mr. Justice Darling held that a chauffeur is different from a coachman

The latter is a domestic servant, and as such is entitled to at least a month's notice. The chauffeur, however, is a trained mechanic, as, if anything goes wrong with a car, the chauffeur has to repair it himself, whereas, on a horse carriage, the coachman simply unharnesses the steed, and the repair is done by someone else if anything goes wrong. The chauffeur, therefore, is a mechanic, and thus the Bench decided. This (says the *Daily Telegraph* in reporting the case) means, of course, that he can be dismissed at a week's notice, and affects especially those old coachmen and others taken on now as chauffeurs who formerly were, as domestic servants, entitled to a month's notice. On the other hand, the chauffeur can leave at a week's notice instead of having to give a month's.

Some Notes on the Indianapolis Race.

Thirsty Drivers and Cars; Slipping Clutches; Breakages of Petrol Pipes.

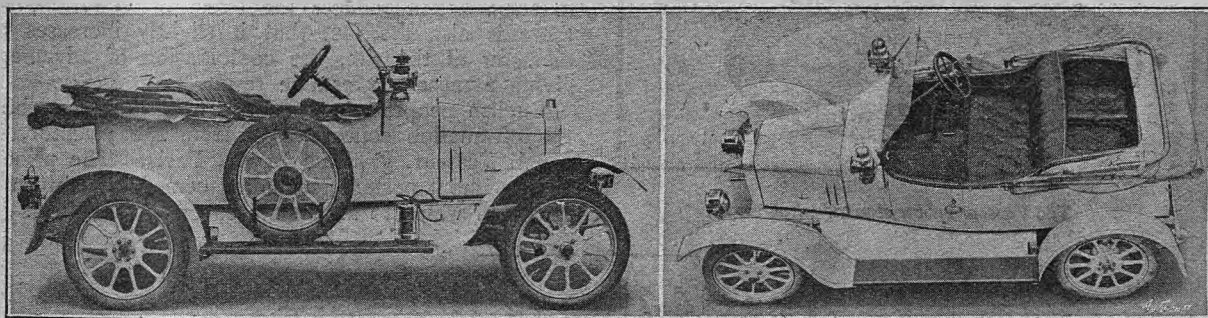
POSSIBLY owing to Mr. Roosevelt's recent action, considerable attention has been given to what celebrities drink. However this may be, immense publicity has been given to the fact that during the 500 mile race at Indianapolis Jules Goux, the winner, consumed no less than six pints of champagne, and, what is more, the moment he came off his car the victor he had another pint, declaring that but for the good wine he would never have scored the victory. One paper refers to the liquid ingredients of his victory as champagne, castor oil, and gasolene.

Between them the twenty-eight competitors used up eighty-eight tyres, so *The Motor Age* says. Only one car, the seventh, got through without a change. This, however, means more than might be imagined, as the driver ran out of petrol and lost half an hour, so that he probably lost second place through this error in judgment; in other words, he did not get through on one set of tyres because he went slowly.

on the radiator cap—quite a handy and useful appliance, by the way, and one which has been used a good bit in this country for testing work.

We never knew before why it was that chewing gum was used so much in the States, but this is also made clear, as one of the cars which developed a leak in the petrol tank was able to continue after the leak had been plugged up with a wad of chewing gum. Whether this gum was inserted in the raw state or after a due course of treatment in the human mouth we are not informed.

Strangely enough, one of the most prevalent mechanical troubles in the race appears to have been slipping clutches. The constant pounding on the track found out the petrol pipes and petrol tanks too in a good many cases. It, therefore, seems probable that the rather frequent clutch trouble was due to frame distortion brought about by the constant braking at the corners; this, coupled with any slight lack of universality in the jointing between the clutch and



A 9.5 h.p. Standard with a most convenient body. The space behind the seat has two small seats on which children can be carried, or these little seats can be removed instantly and the "hold" used for luggage.

The same authority also states that the Mercedes-Knight with the sleeve valve engine, which finished fifth, used only twenty-five gallons of petrol, *i.e.*, twenty miles to the gallon—this seems almost incredible for a high-speed performance—also that the lubricating oil consumed during the run was eight gallons; this seems a huge consumption till one realises the sustained speed, but we are told that one car in the race consumed 104 gallons of lubricating oil. It is scarcely astonishing after this to read a number of complaints about the track being smothered in oil. One would almost imagine that the car with such a thirst for lubricating oil carried some mechanism for splitting it and converting it into petrol.

To return to the Knight-Mercedes, this ran through without any fresh water being added to the radiator. This was one of the cars which had a thermometer

the gearshaft would result with some designs in the clutch being drawn back as the frame distorted, and, consequently, slipping would start. We mention this particularly because it is not a very common trouble in European racing, and it would be interesting to know the precise cause.

Incidentally, the quick cure for slipping clutches was to thrust pieces of saw blade under the leather.

There were a good many carburettor troubles, too, but lubrication stoppages and engine failures were less numerous than last year.

To return to the trouble with petrol piping, it is stated that, although in many cases flexible insertions in the piping were made to provide against the effects of vibration from the track, it was as frequently as not that the breakage occurred in the flexible portion of the piping.

Rigal, who drove the victorious Sunbeam in the Coupe de l'Auto Race, met with an accident last week while practising in the South of France. Fortunately he escaped with a few bruises, and is expected to be quite recovered in plenty of time for the forthcoming race on the Picardy Circuit.

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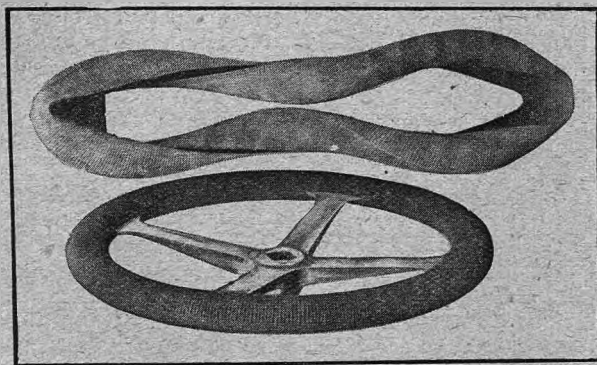
In the House of Commons on Tuesday, Mr. Butler Lloyd asked the Chancellor of the Exchequer whether he would undertake in the near future to make a

larger and more adequate contribution from the Imperial Exchequer towards the cost of maintenance and upkeep of highways consequent upon the ever-increasing use of them for through traffic by motor cars and heavy locomotives, which was rapidly becoming intolerable to the local authorities. Mr. Lloyd George in reply said: This question is one affecting the relations between Imperial and local taxation, and is now being considered by the Local Taxation Committee.

A Grip Cover for the Steering Wheel Rim.

A Refinement which Tends to Comfort and Certainty.

THIS ingenious invention is due to the initiative of one who for a number of years was chauffeur to the President of the French Republic, consequently a practical driver. He has recently taken out a patent in all countries for a rubber cover which takes exactly the form of the wooden rim upon the steering wheel, somewhat on the principle of an outer cover of a tyre. The rubber cover in question is stuck over the wooden rim with a special solution, and gives the steering wheel the appearance of being in solid rubber. On the surface of this cover there are a number of corrugated or raised dots, which give a firm grip for the hands upon the wheel, being a



The Vasseur rubber steering wheel cover.

distinct improvement for drivers, who complain of the polished wood or xylonite rim as being liable to slip through the hands, and especially when gloves are worn. This invention advantageously replaces the number of makeshifts which have been introduced such as binding the rim with cord.

The inventor claims a number of advantages with this rubber cover. In addition to preventing slipping, the rubber, having elasticity, absorbs vibration and lessens fatigue of the hands due to continuous gripping of the wheel, making the steering certain and sure.

We have tried one of these grip covers on the steering wheel of one of our cars and have certainly found it most comfortable. The great advantage from our point of view is the fact that such a comparatively light grip on the wheel is necessary so that when making a long drive there is no weariness of the muscles of the hand or wrist. This is, undoubtedly, due to a variety of causes, though mainly to such a good grip being given. At the same time there is no doubt that the rubber covering acts as a buffer and to some extent reduces the effect of vibration, and there is also the fact that it slightly increases the diameter of the rim, the combination of advantages giving a most comfortable result.

English people interested in this article can obtain all information concerning it from the inventor, M. Henri Vasseur, 57, Rue Bayen, Paris. The price is 15s., without postage, including cement and brush by means of which to attach the cover to the wheel.

The 14-18 h.p. Adler.

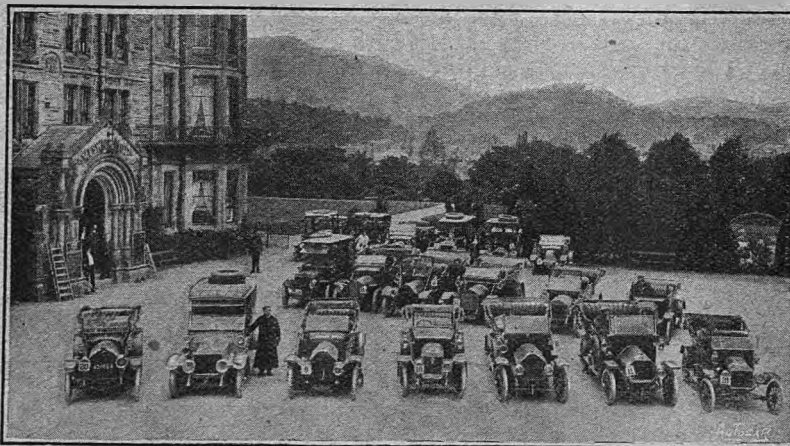
A Short but Satisfactory Test Run Upon One of These Cars.

A FEW days ago we were able to make an interesting little test run on the 1913 14-18 h.p. Adler.

We were the more pleased to make this trial, as Adlers are now fitted with throttle pedals, and not, as formerly, when we have had the opportunity of trying them, with hand throttle levers on the steering wheel only. It may be prejudice, or due to a long course of driving on a throttle pedal, but we are fain to say that we do not feel at all comfortable when driving a car with hand-controlled throttle only. Consequently, with the pedal throttle as now fitted on the Adler we were perfectly comfortable, master of our car, and able to realise the really excellent points of this most satisfactory vehicle. The pulling and hill-climbing qualities of this car, having regard to the engine dimensions, are really remarkable, for the bore is only 75 mm. and the stroke 120 mm.

The speed obtained is all that can be required by any driver who drives with due regard to public safety, for the car's excellent hill-climbing qualities cause it to make a good average on a journey of any length. The engine is remarkably quiet, due, no doubt, to the special valve arrangement which permits of

extra large valves with, of course, lower lift than ordinarily. The steering is quite satisfactory, and the car has a generous lock, useful when driving in close traffic or when negotiating by-lanes with hair-pin bends. As usual with Adler cars, the springing is excellent, and the car holds the road well when running fast over badly pot-holed surfaces.



The International Steel Congress made a brief tour of the English Lakes. The photograph shows cars used in the excursion, waiting during lunch outside the Keswick Hotel, Keswick. The route taken by the excursion was through Lakeside, Windermere, Ambleside, Rydal, Grasmere, Thirlmere, Keswick, Derwentwater and Bassenthwaite Lakes, Ullswater, and over the Kirkstone Pass back to Windermere.

Motor Spirit Manufacture in London.

The Process that was referred to before the Petrol Committee Last Year.

LAST autumn when the Petrol Committee was sitting evidence was given concerning a process then in commercial operation for extracting a volatile spirit from heavy oil. The process was one by which motor fuel was being manufactured from heavy hydrocarbon oils, which in themselves contain no petrol or fractions of low boiling points, *i.e.*, either a residual or fuel oil, a heavy distillate such as that known as Solar or gas oil, or a crude oil. Last December a report on the process was prepared by Sir Boverton Redwood and Professor Vivian B. Lewes. A copy of this report has now been sent to *The Autocar* for publication. The process is in actual operation at Silvertown. The report is as follows:

Report on the New Oil-refining Process.

London, December 11th, 1912.

The new oil refining process consists of what might be more properly termed "wet oil conversion." In order to carry out the process iron retorts 12ft. long by 8in. in diameter are set six in a setting, with a slight downward slope from the feeding end to the point where they issue from the heating chamber. These retorts are filled with iron turnings, leaving an empty space at the feeding end, and the retorts and their contents having been heated to 600° C., as shown by recording pyrometers, Solar oil is sprayed into the empty space whilst water is allowed to trickle in through a feed pipe into the same space.

The ratio employed is about 4 of oil to 1 of water, and these being volatilised by the heat are drawn through the heated iron by means of an exhaustor. Under these conditions a "cracking" or conversion of a portion of the oil into lighter products and gas takes place, with a small deposition of carbon, and the vapours are led through a dephlegmator or atmospheric cooler, the heavier vapours, consisting largely of unconverted oil, condensing and running off from the bottom of the cooler, the vapours of lighter hydrocarbons and the gas passing away from the top of the cooler into water condensers, where the vapours are condensed, and consist of oils containing spirit in solution. The gases still contain a considerable amount of the lightest spirit as vapour, and are led through a "Holmes scrubber," where the gas is washed with Solar oil to dissolve the vapours from it, and is then stored in a gasometer, to be used as fuel in the retort bench, whilst the oil from the scrubber and the oils from the water condensers are put through a continuous steam still, and the spirit is distilled from them.

The residual oil from this still, together with the unchanged oil from the dephlegmator, is then mixed with some fresh Solar oil in sufficient quantity to make up the next day's feed for the converters, and the process is repeated, each time the oil and water pass through the converter a fresh portion of oil being converted into spirit. This mixing of residues with fresh oil is an important part of the process, as if the residues alone were passed through the converter, they would become of heavier and heavier specific gravity until pitch was formed, and the whole plant would be choked up, whilst the yield of spirit would become increasingly smaller and of lower quality.

The small quantity of carbon continuously deposited in the converter, and amounting to about 5% of the oil used, causes a gradual choking of the iron turnings, and necessitates the retorts being cleaned out at intervals; but with the additional units about to be erected this would be done in rotation and would not interfere with the continuity of the process.

The treatment of 100 gallons of Solar oil and the products obtained from it may be diagrammatically represented:

100 gallons Solar oil.			
Sp. gr. 861.			
Liquid residuals 65%.	Gas 30%.	Carbon 5%.	
Petrol,	Solvent spirit,	Varnish,	
39 gals.	13 gals.	13 gals.	
Sp. gr. .754.	Sp. gr. .794.	Sp. gr. .942.	
That is to say, the final products of the process are:			
Petrol	...	...	39%
Solvent spirit	...	...	13%
Varnish	...	...	13%
Gas	...	...	30%
Carbon	...	...	5%

PETROL.—This is obtained as a water-white spirit by the steam distillation of the distillate obtained from the oils from the water condenser and gas scrubber after washing with .25% sulphuric acid and soda. It has a slight alliaceous odour and a specific gravity of .754; in spite, however, of this being high, its boiling points are good, 47% distilling below 100° C., and a series of comparative trials carried out by one of us with a stationary petrol motor directly coupled to a dynamo demonstrates that in the use of the new spirit there is a net fuel economy of 12% to 15% over motor spirit of standard quality, whilst there is no diminution in the ease of ignition and flexibility in running.

SOLVENT SPIRIT.—This is the distillate obtained after the petrol has come over; it has a yellowish tint, a specific gravity of .794, and flash point of 74° F. (Abel test). Its solvent properties are good, and it should meet with a ready sale for the various purposes for which solvent naphtha is employed.

VARNISH.—This is the residue left after the two previous distillates have come off. It has a dark colour in bulk, but when spread dries to a yellow ochre colour with a glossy surface. Mixed with any full colours it gives a good body and dries in twenty-four hours with a bright surface. The varnish has been fully reported on by Mr. J. G. McIntosh.

After carefully going through the working results, the balance sheet of the process may be given as follows:

When the one set of working retorts is increased to fit the capacity of the remainder of the plant, several economies can be introduced, and the cost of labour, fuel, and chemicals employed may be taken as per gallon of liquid products:

Fuel	...	...	...	...	...	...	...	...	...	93d.
Wages	...	...	...	...	...	...	...	...	...	31d.
Repairs and maintenance	...	...	...	...	...	...	...	...	...	25d.
Electric power, etc.	...	...	...	...	...	...	...	...	...	21d.
										1.70d.

Sixty-five gallons are produced per 100 gallons Solar oil treated, so that $1.70 \times 65 = 110.5 = 9s. 2\frac{1}{2}d.$ per 100 gallons.

A quotation has been received for supplies of Solar oil for the next five years at 55s. per ton ex wharf on Thames, which, with the addition of 1s. per ton for barging, will bring the price to "a shade" over 2½d. per gallon. Therefore 100 gallons = £1 0s. 10d., making the cost of the products £1 10s. 0½d. The gas is used as part of the fuel, and the carbon deposit has no value.

The gas made from the oil is not sufficient to give the necessary amount of heat (including that of steam-raising) and is supplemented by the use of a small proportion of Solar oil. With the increase in plant, producer gas would probably be used in place of Solar oil as the supplementary fuel.

Taking 1s. 9d. per gallon as a conservative estimate as the market value of the varnish, and 9d. per gallon for solvent spirit (the market price for such spirits varies from 8½d. to 1s. 9d. per gallon), the following results are arrived at:

Thirteen gallons of solvent spirit at 9d. per gallon	£0 9 9
Thirteen gallons of varnish at 1s. 9d. per gallon	1 2 9
	£1 12 6
Cost of raw material and working expenses as above	1 10 0½

Profit on the sale of solvent spirit and varnish per 100 gallons £0 2 5½

Plus thirty-nine gallons of petrol, or two-fifths of the production, which it will be seen costs nothing.

The price of the residuals is placed at a low valuation, as a market will have to be worked up for them.

It must be remembered that the price of oil fluctuates considerably, and that the price of Solar oil has been below 2d. per gallon. It is now high, but the great increase in the fleets of oil tank steamers will probably shortly lower the freights and reduce the price.

A well-arranged working plant has been erected at Silvertown, and the site, which extends over an area of three and a half acres, is an excellent one, with a good wharf, where tank barges can come alongside. The electric power for driving pumps, compressors, exhausters, etc., is very cheap, the cost being less than 1d. per unit. The present plant at work yields 300 gallons of liquid products per diem, and with the addition of ten more converters (which we understand have been decided upon), the output of the plant will be

increased to 3,300 gallons, the remainder of the plant being adequate for dealing with this quantity. The yield of liquid products will then be at the rate of one million gallons per annum; and there is sufficient space on the premises at Silvertown for further increase of the plant up to an output of more than five million gallons per annum.

Some Comments by W. R. Ormandy, D.Sc.

I have read with great interest the copy of the report on the process by Sir Boverton Redwood and Prof. V. B. Lewes.

The method previously employed for the splitting of heavy paraffins into lower paraffins was by the introduction of paraffin oil into retorts at a bright red heat, the whole under a considerable pressure. This process cost a lot of money both for plant and operation, and it was stated that it was not commercially possible unless the resulting light paraffins could be sold at 2s. per gallon.

It is claimed for the new process that these heavy oils are split at a much lower temperature without using any pressure by making use of the catalytic action of iron on the oil in the presence of steam. The report which has been sent out is certainly very satisfactory, and knowing as I do that catalytic processes in the presence of steam have resulted in decomposition of other oils, it is very likely that satisfactory commercial results will be obtained. It is a pity that a distillation curve was not given of the volatile products which it is intended to put on the market, so that one could have compared the curve with those obtained with the various brands of petrol and with commercial benzoles.

The properties of a volatile fuel which settle its suitability for motor car purposes are vapour tension of the various fractions, and these are brought to expression in a sufficiently satisfactory manner by recording the percentage of spirit which is distilled over at each 5° or 10° of temperature when the temperature is raised in such a manner as to keep the distillate coming over at a constant rate.

Very little information is given as to the physical properties of the various products which it is intended to sell, which is quite a pity. It is, of course, very satisfactory to have good reports from men of high

In conclusion, the process is based on sound scientific principles, well worked out, and with the enormous increase in the consumption of motor spirit, and the effect this is having upon the price, the undertaking should prove one of considerable commercial value, returning large profits.

BOVERTON REDWOOD.

VIVIAN B. LEWES.

standing in their respective departments, but it is none the less desirable that sufficient data should be given as to the physical and chemical properties of the various fractions to enable those skilled in the particular industries to form their own opinion from such data as to the probable applicability of the various materials.

So far as one can gather from the somewhat meagre materials placed at one's disposal, there would seem every prospect of a good future for this process in so far as the company owning it have safeguarded their supply of raw materials. If licences, however, are granted to the large oil companies owning or controlling oil fields, as would seem to be the case, is it not highly probable that the necessary raw materials will be worked up at or near the point of origin by the oil companies themselves? If it be a fact that there is a real shortage of the natural material it is hardly likely that the oil companies will supply at a few pence per gallon the raw material which will enable their customers to produce a suitable motor spirit at a competitive price, if, by retaining the raw material and working it up themselves, they can continue to reap a golden harvest at the expense of the motorist.

It is in this direction chiefly that one can be excused for expressing fears for the future of the process so far as the cheapening of motor spirit is concerned. From the writer's knowledge of the application of somewhat similar means in other directions for the production of motor spirit there would seem little doubt that if the raw material supply question can be solved the process should help to solve the petrol difficulty, always granted, of course, that the shareholders and the promoters do not succumb to the temptation of reaping the uttermost farthing by making a working arrangement with their present competitors for the maintenance of prices.

The 1913 Paris Salon.

We announced a fortnight ago that the Paris Automobile Show will open on Friday, the 17th of October next. It is now officially stated that the show will close on Monday night, the 27th of October; remaining open, therefore, only ten days. Hitherto the closing hour for this show has always been 6 p.m.; this year, however, it has been decided officially to keep the doors open until seven o'clock. As will be seen, it will be open for two consecutive Sundays only; in previous years it has always been kept open for three Sundays. Owing to the difficulty in obtaining the Grand Palais in October a rumour gained currency that there would not be any automobile show at all held in Paris this year, the majority of the manufacturers having come to the conclusion that an exhibition of this description held in December was far too late. Owing to the fact that there is a certain crisis in the French automobile trade generally, and rumours are afloat that several small manufacturers are feeling keenly, financially, the effects of this slackness in business, the more important makers are already giving their attention to the 1914 chassis, so that there shall be no delay in having the new models ready for

the early show. It is rumoured, also, on good authority, that some of the leading makers intend to lower the prices of their high-powered chassis, that is from about 16 h.p. upwards.

Reduction in Tyre Prices.

On the 16th inst. we received the new price list of Michelin tyres, which shows an all-round reduction in price of approximately from 12½ to 15 per cent. On Tuesday we were advised by the Continental Tyre Co. and by the Victor Tyre Co. that they were making substantial reductions also. The Dunlop Co. also announce a reduction in their tyre prices.

The Automobile Club of Turin is organising a three days' reliability trial and speed contest for the 11th, 12th, and 13th July. On the first day the competing cars will journey over a 250 miles circuit, and on the second day a distance of 295 miles will have to be covered; the third day will be devoted to a series of flying kilometre speed trials on the Vercelli-Turin Road.

A.A. and M.U. Notes.

Communicated by the Secretary, The Automobile Association and Motor Union.

Whitcomb Street, Coventry Street, W.

Ligue Internationale des Association Touristes.

The Secretary represented the Association at the Annual Congress of the L.I.A.T., held at Amsterdam from the 17th to the 20th inst., and introduced the following proposal, "To consider the problem of the present and future supply of motor spirit, and the means of dealing with same."

Scottish Tourists

Scottish members and tourists from England are greatly appreciating the provision of larger and more commodious A.A. and M.U. quarters at 2, Castle Street, Edinburgh (two doors off Princes Street), which include a comfortably appointed members' reading and correspondence room and lounge. Full road information regarding Scottish districts, also assistance in tours, etc., may be obtained by members at the Edinburgh offices. The Glasgow offices are situated at Gordon Chambers, Mitchell Street.

Members who have occasion to drive through Ashley Terrace (connecting Slateford Road and Colinton Road), Edinburgh, should do so with great caution. The Association is erecting "school" and "danger" signs in this highway.

The Secretary for Scotland has recently issued an order prohibiting a speed of more than ten miles an hour for cars using a portion of the road leading from Bonar Bridge to the Dornoch Public School (in the Burgh of Dornoch).

Irish Roads.

One of the chief items in the programme being carried out by the Association in Ireland is the improvement of the main roads in the country. As a rule, such roads are under the control of rural and urban district councils, and the Association is endeavouring to get the laws affecting Irish roads so amended that the county councils shall constitute the sole authority over the main or leading roads in the country. One of the roads in Ireland of importance to motorists is the route *via* Fishguard-Rosslare and through Waterford to Killarney. The Association is making special efforts to improve this highway, and it is hoped that before this year is out it will be in excellent condition for motor traffic.

West of England.

Members resident in the West of England should note that the Association now has western offices at 271, High Street, Exeter; Prudential Buildings, Plymouth; Crown Chambers, 18, Quay Street, Cardiff; and Canada House, Baldwin Street, Bristol. A fifth office will shortly be opened at Chancery Chambers, Rutland Street, Swansea.

Special Road Warnings.

Members are asked to drive carefully along the road from the Burrell Arms, West Grinstead, to Broadwater Corner, Worthing. The local authorities may institute prosecutions unless the reckless driving complained of by residents is stopped.

The Eton Urban District Council has decided to strictly enforce the ten-mile speed limit along High Street, Eton.

Driving Mirrors for Trade Vehicles.

The Association is doing everything possible to encourage users of horsed and motor vans and similar heavy vehicles to provide drivers with driving mirrors so that the minimum obstruction may be caused to motor car traffic. Members of the Association could

do much in this direction by fitting mirrors to trade vehicles owned by themselves.

Speed Limits.

Ten miles per hour speed limit orders have been granted for a portion of Roehampton Lane, Wandsworth, in addition to the area covered by a previous order of 1910, and for certain roads in Princes Risborough (Bucks.).

Latest Road Information.

GREAT NORTH ROAD.—Roller working between the 24th milestone and Welwyn, full width, will be left clear at night. Remetalling four miles north of Hitchin between the 37th and 38th milestones, full width for 100 yards, roller at work, clear at night. Roller at work eight miles north of Grantham, full width of road under repair. Roller working 600 yards south of Newark, whole width, lights at night. Under repair between the 6th and 7th and the 9th and 10th milestones from Morpeth, lights at night.

LANCASHIRE.—Blackpool Poulton Road: Special care is necessary through Poulton-le-Fylde and district. Preston-Garstang Road: Caution needed between Withy Trees and Broughton village, also through Garstang. Lancaster-Kendal Road: Control likely to be working in the ten-mile limit in Burton and Milnthorpe, 10½ and 14 miles north of Lancaster. Lancaster-Yealand Road: In bad condition between the 9th and 10th milestones.

YORKSHIRE.—Otley-Leeds Road: Tarring full width between the 4th and 5th milestones. Leeds-Tadcaster Road: Remetalling full width between the 2nd and 4th milestones from Leeds, lights at night. Otley-Harrogate Road: Under repair full width between 3rd and 4th milestones from Otley, roller working, not protected at night. Leeds-Harrogate Road: Under repair full width between 5th and 6th milestones from Leeds, lights at night.

COVENTRY ROAD.—Tarring between the 44th and 45th milestones at Fenny Stratford; also between the 49th and 51st milestones. Under repair full width and roller working between the 35th and 36th milestones; lights at night.

NORTHAMPTON-MARKET HARBOROUGH ROAD.—Remetalling full width four and a half miles from Northampton.

WORCESTER-KIDDERMINSTER ROAD.—Under repair full width two miles north of Worcester; roller working, lights at night.

Members are warned not to use their cut-outs in the following towns: Warwick, Leamington, Kenilworth, Henley-in-Arden, and Rubery.

LONDON-YARMOUTH ROAD.—Tarring at Brentwood between the 16th and 17th milestones; between Ingatestone-Chelmsford; Springfield Bridge, Chelmsford, still under repair; tarring at Stanway between Marks Tey and Lexden; Colchester-Stratford St. Mary.

NORWICH-AYLSHAM ROAD.—Under repair full width at Marsham. Ingworth Bridge under repair.

NORWICH-YARMOUTH ROAD.—Under repair full width at Thorpe, Witton, and Burlingham.

SHREWSBURY DISTRICT.—Welshpool Road: Remetalling centre of road between Shelton and Bicton Heath. Hadnall-Whitchurch Road: Factory Bridge and Comet Bridge in St. Michael's Street, Shrewsbury, are being widened, and cars should take the Ellesmere Road *via* Harlescott.

TAUNTON-BRIDGWATER ROAD.—Under repair five miles south of Bridgwater, Thurloxton. This is a dangerous hill, and members are warned to use caution.

LONDON DISTRICT.—Controls are likely to be working between the following points: De Vere Hotel to Hammer-smith; Putney High Street; Morden; Banstead; Sutton; Purley; Bedfont-Staines; Hounslow-Staines.

KENT.—Canterbury District: Controls likely to be working through Harbledon, London-Dover Road, and four miles between Sturry and Up Street on Canterbury-Ramsgate Road. Members are warned that special caution is necessary on the outskirts of Canterbury, as controls may be working.

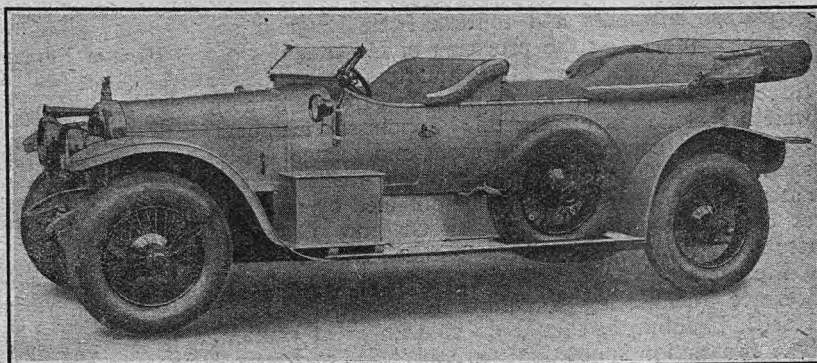
SUSSEX.—Control likely to be working in the ten-mile limit at Uckfield. Forest Row-Wych Cross: Wet tar is left only scantily covered with dust, and caution is necessary. It is intended to repair the main roads between Wychecross-Chailey; Brighton Boundary; Pyecombe; Newhaven-Rottingdean; Lewes-Isfield; Lewes-Hallards; Hailsham-Hurston-monceux; Laughton-Horsebridge; Lewes-Berwick; Steelcross and Eridge Green.

On the Road.

The Motoring Organisations—Their Uses and Abuses.

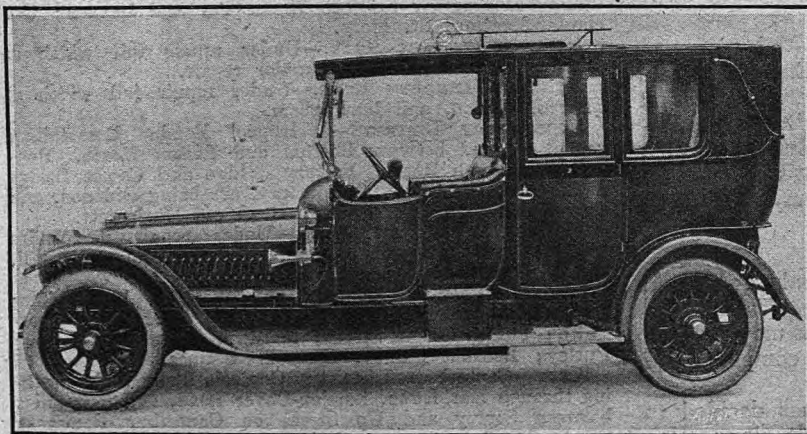
A FRIEND of mine who also "writes for the papers" has either insulted or praised me by calling me "a man with a mission." I must confess he wrote under a certain stress of emotion because he detected me making fun of him; but certainly his phrase has given me furiously to think, and I cannot quite determine whether I ought to be pleased or annoyed by the expression. Certainly, when I began, by the kind courtesy of the Editor, to air my views on the uses and abuses of motoring, the idea of having a mission never entered my head. Indeed, I looked on myself as a proud man because I was allowed to mention our leaders automobilious, and the idea that some day I might venture to criticise those demi-gods never even thought of entering my head. Yet I seem to have done it at times, insomuch that now I am described as having no other task but seeking their conversion. Which is ever so inaccurate, because my chief object in all my writings has been to point out to my readers how beautiful and interesting a thing motoring is, and to induce all the world that reads *The Autocar* to fall to and enjoy it. And now, as a reward, all I get is the reputation of being that fearful thing, "a man with a mission." It is heart-rending. As if I really care one bit how many leaders automobilism may have; as if I mind how many sets of people imagine they lead the movement; as if I trouble how many differently badged and described varlets patrol our highways; or as if I worry one jot how many various societies bawl out that there is only one of any value and that they are that one. True, I have airily proposed that there shall be only one, and that all it need do is to look after the interests of motorists and not disfigure the landscape. But—between you and

me, dear reader—I do not care a jot if there are one or twenty; their presence or their absence is not going to drive me off the road. We humans are an ungrateful race. Unmindful of past blessings, we scrap our remnants with as little compunction as we chuck away our old boots and newspapers. The very men who once saved us from fines and endorsements—if ever they did?—we fail to reverence when they



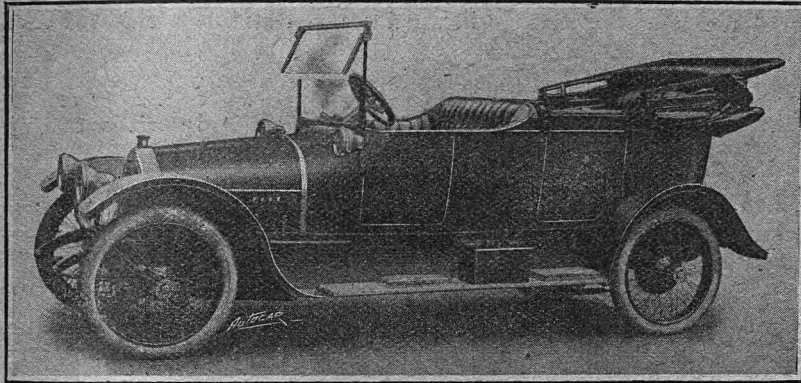
A 40 h.p. Austin car supplied to Mr. W. T. Stralford, Andrews, Director of the Indo-European Telegraph Company, for his forthcoming tour through Persia. In view of the strenuous future before this car, Mr. Andrews has had it fitted with 7 in. Palmer cord tyres.

have nothing to save us from. Even their salutes pall on some, and one beholds—like one does the clowns' that try so vainly to assist in the circus, and only get tripped up in the carpets, trampled on by the horses, or locked up with the performing lions—with pain the antics of useful men wishing to be useful and finding no opportunities. I am saddened when I am waved on by an anchorite with corrugated brow round a corner I can see the other side of. I am annoyed when I am bade to stop because a badged car is converging on my path at a junction (see explanatory advertisement of the value of road guides), and I am amused when I behold a grown-up man busily pretending to be busy when he goes through the form of taking down my number in case I may prove to be a robber or one wanted by the police. These poor fellows remind me of the tale of the Queen from the Northland in the Middle Ages who married a King and lived in a far-off Southern country. As queens will, she pined for a memory of her native land, till one spring, in reply to her wishes, a messenger came to her from her home with a daisy plant. In spite of a different climate, it took root and aroused much interest among her husband's subjects. Indeed, so great was the daily crowd to see this new marvel that the King was forced to put a sentry over the flower. Well, the flower faded and the years rolled on. Then the King and Queen died too, and the grass plot where the daisy grew became a paved courtyard. But still sentry relieved



A 24 h.p. six-cylinder Eraser (90 × 140 mm.) with a landaulet body finished in dark blue with black mouldings and thin yellow lines. Three are accommodated on the back seat and two on folding seats. The interior is electrically lighted and is fitted with inlaid cabinets and companions. The C.A.V. electric installation provides the current for all the lamps and the horn. The wheels are fitted with Warland Dual rims.

'sentry in that same spot, and, because no one can tell now why one was originally put there, I suppose there always will continue to be one. Which is all very interesting and pathetic, and I hope—since we pay soldiers just the same whether they sentry-go or not—that the fine old idea will always keep going. But if the abolition of that sentry because of his useless-



A 15 h.p. Crossley fitted with a cabriolet body by Messrs. Offord & Son, Ltd. It will be noticed that whilst the standard shape Crossley radiator is maintained, the bonnet is tapered to merge with the scuttle dash in a pleasing manner. This particular body is very light, we are informed, adding only 5 cwt. to the chassis. This weight includes the wind-screen, wings, and platform shields. The car is provided with a Rotax lighting outfit, Stewart speedometer, eight-day clock, step mats, Rudge-Whitworth wheels, luggage rack, etc.

ness were to save money, undoubtedly he would have gone long ago, which is where the moral of my story and the moral of my allegory "part brass-rags."

I appear—I am writing this too late for the next number due—to have aroused some. A Mr. Farnsworth, who writes from the Devonshire Club (is it correct, according to club etiquette, to give one's club as an address where a reply is requested?), hopes everybody who is dissatisfied will communicate with him there and see what he can do to put the motoring world straight. He is good enough to praise me "as far as I go," but tells us that I stop short of an alternative. Do I? Did I? I was under the impression that I suggested a half-guinea touch to one and only one society, and the abolition of all useless expenses and purely ornamental fripperies. I believe I almost went so far as to remark that the only things of real value to ordinary motorists—and to only some of them—that our present autocrats give us are the facilities for going abroad with our cars without the trouble of paying duties and undergoing annoying formalities *en route*. Mr. Farnsworth, wants to know whether I want a new society altogether or am content with reformation and coalition of existing ones. The answer is that I do not care one way or another, except that the last thing I am in favour of is another lot of initials, of officials, of re-duplication, and of subscriptions.

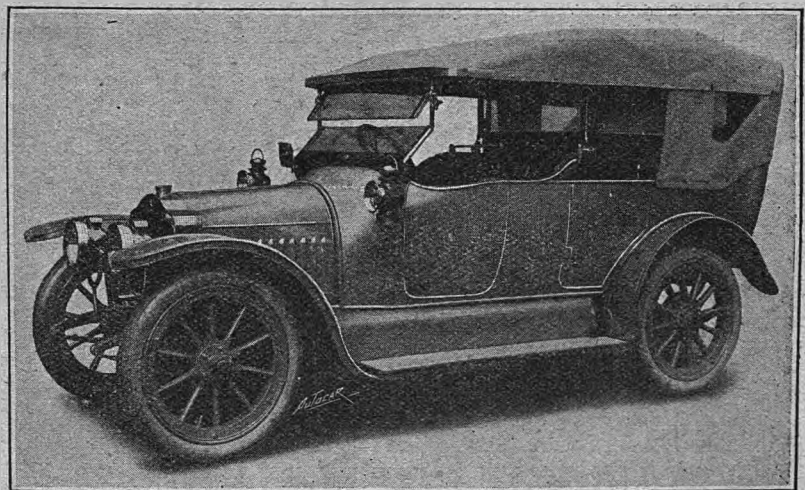
Many people—everyone is not always so kind to me—tell me that I appear to be on the right track in my desire to abolish superfluities, and, personally, I am quite content to leave the intricacies and details

of the idea to others. My desire has been but to point out that at present we live in the past and pay for useless survivals as far as motoring goes. If I have upset people I am sorry, but it cannot be helped, and I still live and am comparatively happy.

I notice elsewhere that some motor journalists and others have been falling foul of the Society of Motor Manufacturers and Traders in their columns, all because it squashed a contemplated Isle of Man race carefully arranged by the R.A.C. without the previously obtained permission of the S.M.M.T. Probably its prevention has played havoc with much contemplated copy, and undoubtedly it has deprived the hotel and lodging-house keepers of that delectable island of much profit. Personally, I should like to have read about it, and no doubt there would have been many and fearful accidents from cars of incredible pace racing on roads entirely unsuitable for such feats. But, since the S.M.M.T. is properly organised—that is to say, is organised to suit the interests of its members—why should it be blamed for doing what seems best for it to do?

Business is business, and what does the S.M.M.T. pretend to be but a business institution? It is sad that, by its close companionship with the R.A.C., it has been likened unto the viper that bit the husbandman who had warmed it back into life, but it is not unnatural that it should consider first and foremost the interests of its members. If it burst to-morrow from inside arrogance or outside competition I should not care, but as long as it exists it is absolutely justified in minding its own business, and nobody is entitled to say that it ought not to do so.

Perhaps if motorists—apart from the trade—had an organisation of their own worth its salt, what that organisation wished would be done. But have motorists any power at all to help themselves? I



A 12 h.p. four-cylinder De Dion (66 x 120 mm.) which has been supplied to Major A. F. Poulton, the Chief Constable of Berkshire. For bad weather the whole of the back portion of the car can be enclosed by means of an Auster back screen and side curtains fixed to the hood. The car was supplied through the Caversham Motor Co., Ltd., the Berkshire agents for De Dions.

On the Road.

remember a well-known motoring peer almost threatening the Unionist candidate at the late Newmarket election that if he talked about spending Road Board moneys on the relief of rates—or something—motorists would refuse to help him, and consequently he would be defeated. But he got in, and I have read nothing more of the threat since. Likewise, last week the leader—or one of the leaders—of the Automobile Party in the House of Commons moved the second reading of a Bill to wipe endorsements off licences after a certain period. On this topic I have read reams, and certainly I imagined that the Bill would be carried through both Houses amid cheers and enthusiasm. What happened? Mr. Joynson-Hicks made his speech, and, there being only thirteen other members in the House, the debate came to an ignominious end. What bathos! What a reflection on our Automobilia Powers that be! The Bill was a just one, contained nothing unfair or objectionable, nothing even acrimonious or startling. Every M.J. uses cars at and between elections, yet only thirteen of them took the trouble to come inside the Chamber and help to form a *quorum*.

The miserable truth that motorists (who care) must glean is that at present they are about as big a power in the land as a flock of old goats, and that all the wit and eloquence of a thousand after-dinner speeches are not worth the paper the *impromptus* are written on. If automobilists want business they must have business leaders, and for a beginning I suggest that at automobile banquets the speeches shall have precedence of the victuals and that journalists should be invited to make their own notes and not be content with those carefully provided for them. Filled with well-chosen foods washed down with priceless vintages, and lighting selected and expensive cigars and sipping rare and curious liquors, how is it to be expected that there will be any criticism of value? Why, the mildest sarcasm would appear sharper than a serpent's tooth, while disagreement might involve everlasting excommunication. "Feed the brute" was the advice of a great man once to a

wife who wished to know how to retain her husband's affections, and well have our automobile leaders acted up to it with regard to the Mighty Engine of the Press—that is, the Press that deals with this type of "news." I do not blame the Press. Journalism is a badly-paid and nerve-trying profession, and the plums are few and far between. One large automobile banquet per week unwisely eaten ought to last—with following indigestion and consequent enforced abstinence—a hard-working man until the next one. The

spirit is willing, and, after all, what is written one week is forgotten the next—even if it be read. But flattery sticks, and there is "no use" for those who have not an endless stream of it. Perhaps I am foolish to go on my own; perhaps I might have done better to be otherwise. But, as the poet says:

"I have no spirit of skill with equal fingers

At sign to sharpen or to slacken strings;

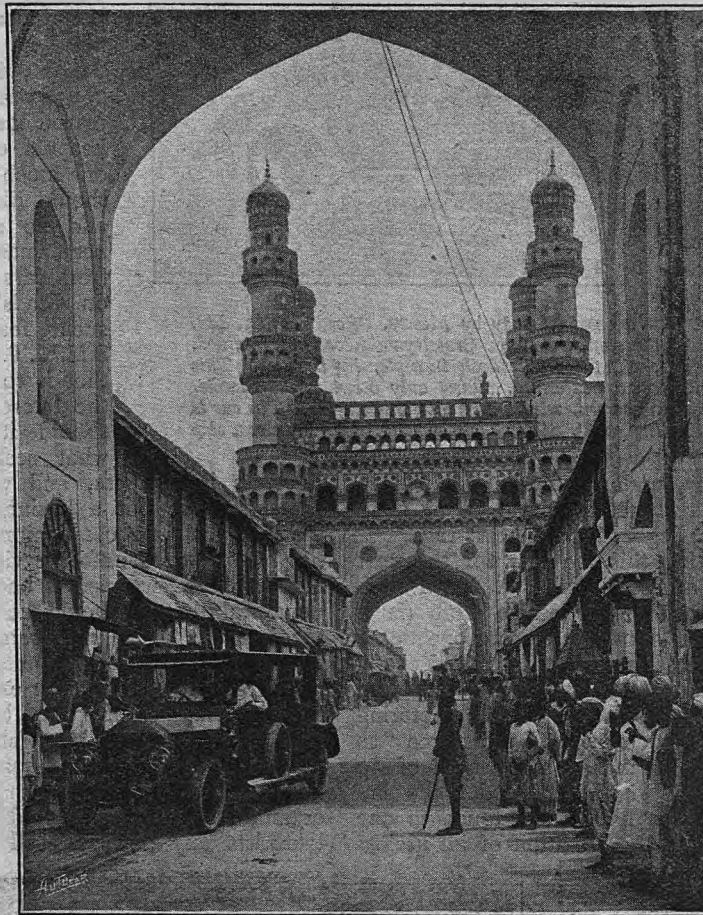
I keep no time of song with gold-perched singers

And chirp of linets on the wrists of kings."

My friend who called me a "man with a mission" builded better than he knew, because now that I find out this is what others think I can let fly with the consciousness that I am only doing what is expected of me. What my neighbours have been pleased to call my "liver" will now no longer be an excuse: I have been

informed of my true object in life, and if they don't like it they can lump it. Yet I feel sure that critics are not happy. I played cricket with one last year, and I hit the first ball hard to square-leg. I called and we ran. I ran two, but he only ran one. Consequently I was run out—we were both at the same end, of course—and I promptly asked him why the something he did not do as I did, adding that we could easily have run three. He replied that he wanted the bowling. I spoke my mind to the other twenty players, but I had to go. The next time I came across that man was in an article he wrote in a morning paper. He was sticking up for the Royal Academy! There are some men who will do anything to achieve originality. My only craving is for Peace.

OWEN JOHN.



The "Char Minar" in the city of Hyderabad, India. This structure is 180 ft. high and 100 ft. wide on each side. It was originally designed to be a college of science, the principle being that each storey was to be devoted to a different study. The car in the foreground is a 59.9 h.p. six-cylinder Napier belonging to Mr. W. J. Procter, of Bombay.

The Institution of Automobile Engineers.

A Diary of the Visit to America.

(Continued from page 1095.)

A FURTHER instalment of Mr. Massac Buist's log of the Institution of Automobile Engineers and the Society of Manufacturers and Traders' visit to America is to hand. We reproduce in full those passages relating to the visits paid to American motor works.

SATURDAY, MAY 31ST.—To-day was devoted to visiting factories in the morning, commencing with the Wheeler and Schebler Co., which is the largest carburetter works in the world, producing carburetters at the rate of about 400 a day. The experimental plant practically reproduces that at the headquarters of the Automobile Club of America in New York. There are besides special rooms, the temperature of which can be regulated at will to twenty-five degrees below freezing point to reproduce the severest winter conditions, for, in producing carburetters for American cars, the problem of variation of temperature has to be very specially studied. The low proportion of hard labour, as in the finishing processes, struck me as being somewhat remarkable, while here, as at all other factories we have yet seen, the operatives appeared to be taking everything so leisurely that one might be pardoned for concluding that half of them were idlers. In point of fact, of course, it is a case of a triumph of organisation whereby the machine does everything, and the man in charge of it is chiefly a looker-on.

From here I drove in Mr. Harroun's car, with paraffin carburetter, to the Prest-o-Lite Co.'s plant at Speedway City. This well known motorist won the 500 mile track race at Indianapolis two years ago on a Marmon car. The device in which he is now interesting himself runs on what the Americans call full oil, and what we might style lamp oil. It starts up on petrol fed from an auxiliary plant. The remarkable thing about the scheme is the utter absence of smell from the exhaust as well as smoke, thereby proving that the combustion is correct; while it enables the engine to be run very flexibly, and the carbon deposit did not appear to be excessive, and was mere dry dust. Care has, however, to be taken to regulate the lubricating oil quite correctly, else trouble can be experienced from this source.

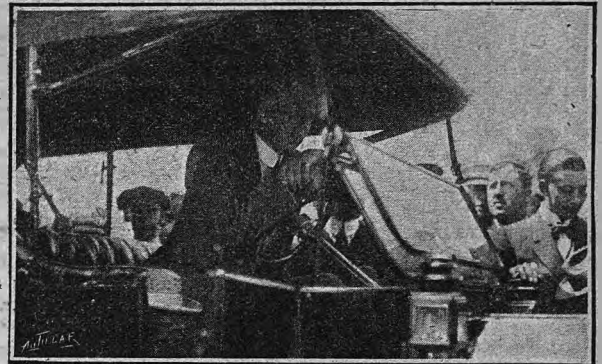
The Prest-o-Lite device is known in Europe as dissolved acetylene. The factory is quite new, and is at present turning out about 500 complete sets per day; but as soon as the organisation is completed, the regular output will be increased to 1,200. From the motorist's point of view, in an age when electric lighting is the thing for cars, perhaps the chief interest of many of the uses to which we saw the Prest-O-Lite device put was for starting engines. This is employed in combination with the Thurber rotary starter, which works in conjunction with compressed air furnished by the Kellogg water-cooled high-pressure pump that makes possible the carrying at all times of 200 lbs. pressure. The air is stored in a welded steel tank situated out of sight under the body of the car. To set the engine going, the driver has only to press a double-acting valve with his foot, an automatic clutch disengaging the starting apparatus the moment the engine begins to work itself.

Luncheon at the Canoe Club followed, and in the evening the party left in a sleeper for Detroit at nine o'clock.

SUNDAY, JUNE 1ST.—The City Hall at Detroit was decorated with the legend, "Welcome to the I.A.E. and S.A.E." For several hours in the afternoon we drove about the beautiful city, that does not give one the least suggestion of being a vast manufacturing centre. It is so clear and bright and free from high pressure that it might be purely a pleasure resort. We had our first glimpse of Canada when we went over the bridge to Belle Isle and beheld British territory from the far shore. This magnificent park is something quite fresh to our experience. There are no barriers or red tape. Motor cars are drawn up on the grass, and you are allowed to drive about the avenues at 15 m.p.h. When the Americans work, they work; when they play, they play. There is nothing in the streets reminiscent of the tense strain with which folk go about London. The new world nation has much more versatility, much more enthusiasm, and absolute optimism. I noticed here, as in other cities, the extraordinary number of electric vehicles of a covered runabout sort, such as women of all ages handle. In fact, most of the shopping is done by this type of car, which is quite unknown at home, but the advent of which we may look for at no distant date. The Detroit Board of Trade, too, is a live body, which can show

points to our Chambers of Commerce at every turn. Let me give an example. Suppose any big manufacturer in this town buys anything out of it, the Board of Trade starts inquiry why the given item cannot be produced in Detroit. It does not rest until the article in question is being made in the town of it be one for which there is any material demand.

MONDAY, JUNE 2ND.—The business of our visit began at nine o'clock, when we left the Pouchortrain Hotel for the Ford Motor Works, some six miles out. Here 16,400 men are employed on an output intended to total 200,000 cars this year, but which will not be attained in that this still growing factory has yet further to be enlarged on a scheme which is estimated to produce 300,000 cars next year. Here, as in our own country, the Ford proposition is sufficiently prominent and popular to be the subject of ceaseless comment, not a little of it humorous. My first and last impression of the whole organisation was that it was the most typical American thing, from the preconceived British point of view we have yet seen. It is the one which has had no surprises for us. I should not like to set down facts concerning the business. I rarely got the same answer to the same question from any two men. I suppose part of the explanation is that the development is so rapid that they are always thinking not of what they are doing, but of what they are hoping to do. The present floor space represents forty-four acres, and the total factory space 2,400,000 square feet, while contracts have been let for additions which will



Mr. Basil Joy, the Secretary of the I.A.E., acknowledging the presentation of a Ford car at the Ford Company's Works in Detroit.

increase the area by 40%. The whole organisation is the scheme of a master brain, and is unique, inasmuch as the factory has been designed from the very outset solely for the particular class of work it is now doing. Therefore, the great aim is output. Here one might almost say that a premium is put on ignorance, inasmuch as that is a basic principle of dealing with the labour problem. The factory notices are posted in four or five languages. Comparatively very few of the operatives understand the simplest of English. The emigrant type from the Continent predominates. Considering that they are worth practically nothing in any other organisation, they are very highly paid. Scarcely anybody makes less than £2 a week, and £2 10s. is quite an ordinary wage for wholly unskilled labour. The men taken on are told each to do one thing only. As practically every Ford process is specialised, what they learn at the works is practically of no use to them in any other factory. Therefore, there is no striking, for the factory is not producing mechanics, but dull men to feed ingenious machines. Another curious point is that the men are paid by time and not by piecework, yet in no factory I have yet seen is more work produced by the men employed.

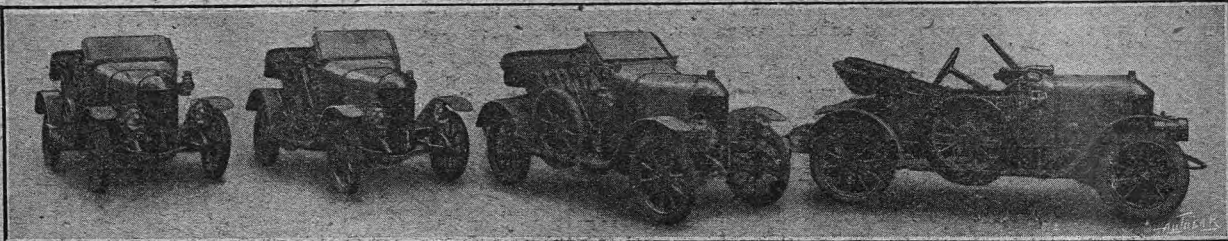
Frankly, I do not think there is anything to tell you about the Ford car that you cannot see revealed by glancing at the machine itself. Perhaps the only thing you cannot conceive of without coming here is the almost appalling scale of output. The central crane way serves the whole machine shops on a scheme that has scarcely cost more than £3,600, which is expeditious, and which, by passing the materials from overhead, where space is not valuable, saves it underneath.

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where space is precious. Unlike most works in America, there is no smoking here; also there can be no slacking, because space is so precious that if a man does not get through his work by the regulation moment, I fancy he would stand a very good chance of being buried alive under accumulating material! Mr. Henry Ford himself owns some 65% of the stock, and his yearly income, after paying taxes, is something more than a million and a half pounds sterling! The small parts of cars are not counted, but are handled by the box full; the numbers are known by weight just as in banks they count sovereigns by weighing them. Some 700 complete cars issue from the works every day. Most of my informants prefer to talk of it as a thousand a day. You see they are enthusiasts who do not think they have done sufficiently big things yet. The engine testing system beats all quick lunch stories to a standstill. The completeness of the departments is amazing, and includes the making of screws, radiators, petrol tanks, and so forth. Some notion of the scale on which things are done may be had from the fact that from eight to ten tons of waste paper accumulates every day. A plant is therefore to be installed to utilise this for the making of little bins for storing materials. The men are paid once a fortnight, but there are so many to pay that every day in the week is a pay day for somebody. Moreover, in the case of all hands who have been employed in any department for three full years, a bonus representing 10% of their salary is given at Christmas time. 80% of the employees are foreigners. On an average about ten men have to be engaged for one who proves good enough to be kept on permanently. Streets of stores have grown up besides the factory. The thronged and noisy scene at luncheon time is like an eastern bazaar. At the

Here, however, you can do no such thing. The best American factories have boards of engineers. One man is a specialist on gears, another on suspension, a third on engine noise and so forth. Each of these "main men" will have a staff of several engineers under him. An absolute check is kept on treachiness, because no one individually in a given factory has an absolute veto as to what shall or shall not go to the scheme of a car. Considering the costliness and the cleverness of this scheme for ruling out weak points, I must confess that to me it is amazing that the average American cars are not more brilliantly designed than they are. Maybe it is just because of the suppression of individual idiosyncrasy that such a penalty has to be paid. In the case of the Cadillac, however, you have a notable exception. If ever a car had individuality, this is it. All American motor manufacturers will tell you so, and they all take off their hats to the Cadillac as representing about the best proposition for the moderate money in the shape of first-class goods. Yet from the European point of view there are quite a number of things in the Cadillac practice that are quite old-fashioned, just as there are unexpected novelties in the works management, as instance, the fact that the men are served twice a day with milk, and it is found that they work much better in consequence—a proposition, this, after the heart of S. F. Edge in his latter day moods.

I have seen so much that I can scarcely get the works in proper perspective at so brief an interval. But I remember being struck particularly with such details as the rapid spiral grooving machines for cutting oil ways in the main bearings, the methods of babbitting these with white metal, the rapid Davenport cutter which performs five operations at once, each of them being in varying ratio to



A fleet of Morris-Oxford light cars, photographed outside the premises of Messrs. Stewart and Ardern, Ltd., 18, Woodstock Street, Bond Street, London, W. The positions of the cars give a very good idea of the appearance of the Morris-Oxford from different standpoints.

conclusion of our visit, Mr. George Houk, who represents the Rudge-Whitworth Wire Wheel and other interests in America, presented Mr. Basil H. Joy, secretary of the Institution of Automobile Engineers, with a car that had been assembled during the period of our visit.

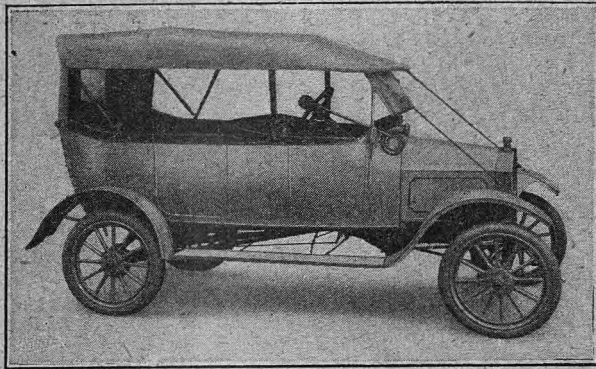
At two o'clock we set off to visit the oldest manufacturers of cars in Detroit, the Cadillac Co.'s works, situated in the city. Here 15,000 self-starting cars, representing a sales value of \$30,000,000, will be produced by the year ending in July. Quite 18,000 cars will be made next year. This is in every way a most absolute contrast to the works we saw in the morning. The problems to be dealt with are utterly different. The shops are, from the American point of view, old ones. The space problem is over-mastering by reason of the city being developed on all sides of the works. Therefore, though the firm makes its cars in a much more complete sense than our British ones do, the Cadillac works are perhaps the most remarkable for the number of vehicles produced in the space available. The present floor space is thirty acres, and the average number of employees 7,000. As they are nearing the end of the manufacturing year, in that the last batch of cars were begun to be assembled on the 15th inst., all the shops were not going at full output. This is not only the firm that has pioneered the self-starting car throughout the world, it is besides unique in being dominated and premeated by the grand old man of the motor movement in America, "Uncle Henry" Leland who is well over seventy years of age, and as alert and active as a man half his years. Despite the use of the most extraordinary and ingenious machinery, the human element is the predominant thing, and the premium is always on skilled labour. Cadillac men are worth good money to other factories.

In our country it is customary to be able to refer with truth to some one engineer as being the man who is responsible for any given make of car, as instance, Royce of Rolls-Royce, Coatalen of Sunbeam, and McCormack of Wolseley.

the other, the magazine for slotting the heads of screws (for the firm depends on no outside sources of supply for these), the block testing dynamometers, the mountings for the engine erecting, so poised that one man can turn the motor into any position he desires, and the testing of each axle when assembled as a unit in an echoing room for silence of running.

You are to understand that there are no fewer than one hundred and twenty-eight departments in this works, from which between seventy-five and eighty complete motor carriages of the finest quality and something more than medium size issue every working day. It is the biggest output for the size of factory that I have ever been confronted with. Some of the machines are remarkable, as instance, one which drills thirty holes through the upper part of the crankcase in a single operation in something under one and a half minutes. Each end of every connecting rod is weighed separately, then the whole, together with its assembled piston, is weighed for balance. In the Cadillac works all the men can tell you the why and wherefore of what they are doing. Here, as at the Packard Works, the valves are built up, a practice which we should call very daring, but which has the proof of years of satisfactory service to justify it. The bevel gears are copper plated before the final cut, so that only the surfaces actually exposed by the finishing cut are hardened. The process of shrinking the copper water jackets on to the cylinders merely by dropping a red hot ring over the jacket is extremely simple, occupying something like a quarter of a minute in each case. The chassis are tested, not on the road, but in scientific fashion, by coupling up the road wheels to dynamos. The completely assembled chassis is run at nine horse-power for one hour at a speed of approximately twenty miles an hour, then at twelve horse-power for an hour at approximately the same speed, then for ten minutes on the lower gear, next for ten minutes on the intermediate gear, and finally for ten minutes on the reverse speed. Each of the

racks on which this final chassis test is made accommodates about four cars each working day. During testing specialists alone touch the machines. Carburetter adjustments are being made by one man only, ignition adjustments by another man



A Ford chassis fitted with a taper bonnet and a flush-sided body. The bodywork is by Messrs. Hoskison, Ltd., Aston Cross, Birmingham.

only, and so on. This, of course, is only the culminating test of many.

During my visit to the factory, I had the good fortune to run across Mr. C. F. Kittering, the brilliant chief engineer of the Delco self-starting apparatus, introduced to the world in commercial fashion on Cadillac cars. He told me that 36,000 of his apparatus had been supplied during the current year, and that 80,000 will be supplied next year. The problem of producing an engine-starter is not to evolve something that will turn the crankshaft over, since that is simple, but to keep batteries stored for lighting and so forth. The evolution of this apparatus consists of two things: first and foremost, the lay public's increasing knowledge of how to use them, and, secondly, the producer's increasing knowledge concerning how much he can leave out by process of gradual elimination. The device is being made more and more simple every season, though it would have been impossible to have introduced it in its present simplified fashion until the public had become accustomed to the idea of the self-starter. There are no fewer than 45,000 Delco apparatus in use on cars to-day.

TUESDAY, JUNE 3RD.—To-day we have experienced yet another contrast in American motor manufacturing when we spent the morning in visiting the Packard Motor Co.'s plant, which is about the largest for the number of vehicles it produces of any in the country. The firm has been established ten years in Detroit, and to-day employs 7,000 men working on thirty-eight acres of floor space; the monthly pay roll being approximately half a million dollars. Eighty-four distinct trades are represented in the plant, one part of which is devoted solely to the production of the two six-cylinder models, rated respectively at 38 and 48 h.p., and the other portion to a motor van factory, where two, three, and five tonners are being produced. Like other works, they have, of course, a doctor and ambulance plant on the establishment, while more exclusive features embrace a band of forty-eight players, all of whom are engaged at the works. This band dates back about two years. One of the overseers is the conductor. The men are paid for performing and give a mid-day concert every other day as well as on Thursday evenings. There are two restaurants for workpeople, 1,700 of whom are served with dinner every day at prices so moderate that they must represent the bare cost of the food. The office hours are from 8 a.m. to 5 p.m., the administration department being laid out on what they here call the sanitary principle, but what we would style well lit and ventilated glass compartments. The main staircase and hall are of marble.

A corps of guides are kept permanently to conduct visitors over the premises, to the total of over 15,000 a year. The firm has its own photographic galleries, and publishes its own illustrated monthly magazine, having a circulation of 30,000 copies. I do not remember any works where there is such an amplitude of space as here, four and a half miles from the centre of the city. Practically every part of the car is made, including the wheels. The impression left on the mind is that this is a high-class English motor manufacturing concern. The conscientious methods of production strike one as being almost necessarily wasteful at times, as instance the manner in which a given part may be passed

The Institution of Automobile Engineers. from one machine to another to have a single hole drilled in it by each, when quite a number of them might be done at one operation without any disadvantage. Here one sees a larger proportion of parts carried than at other works; in other words, the system of each department producing in perfect proportion in relationship to the others, and so reducing to the minimum the number or amount of material on hand, is extraordinary. Nor do, I think, we have any motor body works with an appreciable scale of output which adhere, as this concern does, to the two score coats of paint principle. The Pettingill Machine Co.'s mechanical hammers for shaping the aluminium body panels are very neat, while throughout the workshops is an amazing absence of sawdust, all of which is conducted away, as quickly as it is created. The floors of the factory are marked with painted arrows to indicate to the guides the order in which they are to conduct visitors through the various departments. The Packard crankshafts are balanced. Again, the valves are made in built-up fashion with nickel steel heads. The car itself runs in refined fashion, but one cannot conscientiously say it is a Rolls-Royce, though probably just as much money is spent on producing it. The firm's departments include a photographic gallery so equipped that a car can be placed in any desired position, as, for example, to enable a bird's-eye view to be taken of it.

We discussed the Packard car transmission on the rear axle as we drove to the Timken-Detroit Axle Co.'s works.

JUNE 3RD (Later).—At half-past seven o'clock this evening Mr. Howard E. Coffin took the chair at a joint banquet of the S.A.E. and I.A.E. at the Pouchatrain Hotel. Mr. Oscar B. Morse, Mayor of Detroit, presented the freedom of the city to the two Institutions in the form of an illuminated address, which embraced all the members. George Houk forthwith suggested that we should place it on the back of Joy's presentation Ford car, and start a tour of the city at top speed just to see what the freedom was worth. The Grand Old Man of the motor industry in America, "Uncle Henry" Leland, the president-elect of the Society, spoke to a toast, "The Ideal Motor Factory," and held the audience spell-bound by his personality and his wit. His secret of how to arrive at what none had yet attained, the ideal motor factory, consists of two words—"Know how." There would come a time, he said, when every worker on it would know how, and then we should waste no more time and money

SUBJECTIVE EDITION The Daily SCE Published Aboard the City of Detroit III and Printed Sometime During the Night or Day Sometimes. Two Cents

Weary and Worn British Engineers Board Vessel Great Excitement Marks Sailing of Engineers

Surfeited with Food and Sight-Seeing, Visitors Fall Prone on Deck BARBARIC HORRORS STUN 'EM

Wildest Confusion on Quay, City of Detroit III Begins Trip to the "Soo" MC'MURTRY LATE, AS USUAL

Englishmen Bay for Harry but are only Escaped with Additional Torture by Unwieldy Hordes of American Incurious

Farjans, of Belfast, Falls Overboard, Revived by Champaign; Coffin and the other forty-seven March Ahead with Great Band

The sailing of the City of Detroit III last afternoon marked the first ocean voyage which has been given our English guests to sail down and back for a season. Ever since they landed in New York last afternoon of May 15th, the British Engineers have been hustled from one point of interest to another. They at least know, now that they have crossed the grand old, that they can't be made to walk beyond the confines of the hotel, and having had experience with some of our foremost ocean-going vessels, they can't be many points of interest about a lake steamer.

Up toward the bow of the boat there was a band and the night a grand concert was held. A group of one was packing on board a table that, after the work was over, displaying the work was left to Captain, the first mate, and the other two. The ship's day was over, and the night was over. The ship's day was over, and the night was over. The ship's day was over, and the night was over.

They're Off

Scene of Wild Confusion on the Getaway

The title page of the first copy of the series of humorous newspapers published on board the City of Detroit III. during the Automobile Engineers' trip.

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on non-productive employment in the guise of inspectors. All such dead charges on present production as inspecting would be deleted from the scheme of things one day, because it was cheaper to do perfect work than bad work. But the man who makes any part of a car must first "know how"! The latest machines must always be bought, no matter what the cost and what the sacrifice of scrapping earlier types. We wanted no right and no wrong production of parts of cars; no jobs done twice over to make them good enough; no food for the scrap heap. Therefore, your training would have to include the fellow from whom you bought your materials. As for the talk of over-production, he said, I estimate there are at least thirty millions of people in America who are desirous of owning cars. The demand for the right sort of thing cannot be fulfilled for years and years to come.

Thomas Charles Pullinger, of Arrol-Johnston, Paisley, spoke next and proved popular. He also took up the question of dead charges, which were in the neighbourhood of 100% on your labour bill if you included office staff, inspectors, and foremen. He is getting splendid results with having time expired soldiers and sailors who understand obedience and are willing to learn; whereas he complained that the ordinary shopman thought he knew best and would not be taught. In all factories to-day it was needful further to perfect production to reduce the number of parts scrapped.

Mr. N. E. Hawkins spoke on the system of Ford sales organisation. Then there was a cinema show of "The smallest car in the world in the world's largest city"—Prince Olaf's miniature Cadillac passing through London.

WEDNESDAY, JUNE 4TH.—The business of to-day opened with a visit to yet another type of American motor factory, the Hudson motor car plant that produces a 37 h.p. four-cylinder and a 54 h.p. eight-cylinder model, on the principle of employing four dozen engineers under Mr. Howard Coffin and the "unit specialist" method of manufacture; that is to say, the Hudson is probably the finest assembly plant in the motor world, the experimental car being produced in its entirety at the factory; then blue printed, each of the parts being built by some specialist of the given product, working under the continuous inspection of a resident Hudson engineer, the scheme being claimed to reproduce the plan of U.S.A. battleship construction. Thus, at the Hudson plant, we saw that it was needful to employ only a limited number of men and comparatively few tools and machinery.

Our next call was at the works of the Continental Motor Co. that produces the Hudson engines. This concern employs 2,000 men and has a capacity of 45,000 motors a year, by far the largest exclusive internal combustion liquid fuel building concern in the world, having a total floor space of 365,000 feet.

Then we hurried away to the Chalmers Motor Co.'s works to inspect a wonderful and distinctive organisation built up by one of the most versatile works managers in America, Mr. Harry H. Pinney. The works has a capacity of 8,000 cars a year—a 36 h.p. four-cylinder, and 54 h.p. six-cylinder model. I noted in passing the apt use made of the Electric cutter of the Eastman Machine Co., of Buffalo, which cuts out a couple of dozen or more pieces of cloth for making hoods and such like parts. The paint is sprayed on the wooden wheels, which are dried in ovens containing warm air diluted with precisely the proportion of moisture to be found in the wood of the wheels themselves, so that there is no cracking. Vacuum cleaners are employed every day in the doubly enclosed coachwork varnishing and drying rooms.

The system of checking the raw material in the metal bar by having, in addition to the usual colour schemes, a black check mark to indicate that each piece has been certified right is excellent. We also saw what Charles Wheeler styles the torturing of steel into shape, as instance the placing of metal sheets beneath the 8-ton hammer, which, at a single stroke, produces a perfectly moulded mudguard. Some of the fractures in the shop tool laboratory were very fine. Some notion of the organisation may be had from the fact that the labour on a stamped six-cylinder crankshaft, including the weighing and balancing of it through every stage until it is presented as a finished article, is one dollar forty cents. When the factory is working at full output one complete car issues from the works every twenty minutes. We were at the turning over time, for all the leading American makers will commence on the 1914 output any time from a month to six weeks hence.

Our visit has already made abundantly plain the fact that every factory here is busily engaged tackling a combination of problems peculiar to itself, and with which its rivals are not concerning themselves. Also the U.S.A. is to-day a country which shows the world what can be done

by daring to think and act big. That is the secret, for I have yet to learn that the automobile engineers here are collectively brainier men than the average in Britain or on the Continent of Europe. One of the secrets would appear to be that the American capitalist has imagination to see ahead and pluck to act on his foresight, in place of being, like the bankers of Europe, the throttlers of enterprise.

On board the *City of Detroit III*, the party sailed to Lake Huron, and one of the entries in the record of the voyage reads:

"Soon after sailing everybody aboard was presented with a copy of the S.A.E. song book, of which good use was made after dinner, when the Britishers lured the indefatigable and ever courteous McMemty into Parlour N and thrust a silver dish into his hand as a trifling modest remembrancer of all he has been doing for us and the warm place he has won for himself in all our hearts. In the same congested white hole of the Detrouiter we attacked Secretary Basil H. Joy, and made him find room among his souvenirs for a silver tray for Mrs. J. in token of our gratitude to her for lending him to us for this trip. And so to bed."

THURSDAY, JUNE 5TH.—Steamer or no steamer we were up betimes, and got to business at once with Howard Marmon's presidential address, after which T. B. Browne presented "Big Chief" Clarkson, secretary of the S.A.E., with a memento from the English contingent, and papers were read and discussed till after one o'clock, the meet being resumed on the stroke of two, and closed at four o'clock by our arrival at Sault St. Marie. Various matters of interest in the papers and discussions will be dealt with later.

FRIDAY, JUNE 6TH.—We awoke to find ourselves striving to keep away from our objective—Makinac Island. Explanation: Had we put into port there would have been no one to support President Marmon at the morning's session. So we kept off till two o'clock, and managed to get quite a number of things said about wire wheels and other puzzles before landing. Others of us hired buggies and made a tour of the chief features of this famous pleasure resort and quaint old tell-tale of wars between white man and redskin, French and British, British and American. It was strange to find oneself in a part of the world where they boast of antiquities dating anything from a hundred to sixty years back!

SATURDAY, JUNE 7TH.—Last session at high compression. Trunks under higher compression still. Packers exploding occasionally under highest impossible compression. Souvenir photo sittings the order of the day. Much exchanging of cards, regrets at too brief meetings, and promises of weekend exchange of Transatlantic visits—"when that bridge is built." Meantime, we unearth a bright lad in Charles Harrison-Ainsworth, some time assistant works manager at Rovers, who has "made good" here as superintendent of the Rands Manufacturing Co., of Detroit. As for the friends we have made, they are so many I dare not attempt to name them. Everybody we have met has treated us as though the honour of his country for the land of unrivalled hospitality was in his keeping.

At ten o'clock to-night we set sail from Detroit to Cleveland, stored with happy memories of a time as good as anything in the Arabian Nights and of experiences that have proved to us that all, and more than all, the romance of the sparkling days of Queen Elizabeth exists in this amazing new world to-day, from which we have so much to learn, for, despite our best efforts, we are aware that at most we have been impression catching at high speed—a fact I have striven to bring home to you in these passing notes. As far as I can foresee, age cannot wither nor custom stale the infinite variety of America and Americans.

We are advised by Messrs. Argylls, Ltd., Alexandria, that the sleeve valve litigation between Messrs. Knight and Kilbourne and themselves has ended. First of all the action was decided in their favour in the high courts, and then the appeal was again in their favour. To summarise the position in Messrs. Argylls' own words we may quote the following paragraph from their letter: "Following this second success of Argylls, Ltd., the parties have by arrangement put an end to the litigation between them in this country. The effect is that the proprietors of the Knight patents accept the above-mentioned judgment of the Court of Appeal."

The 12-20 h.p. Benz.

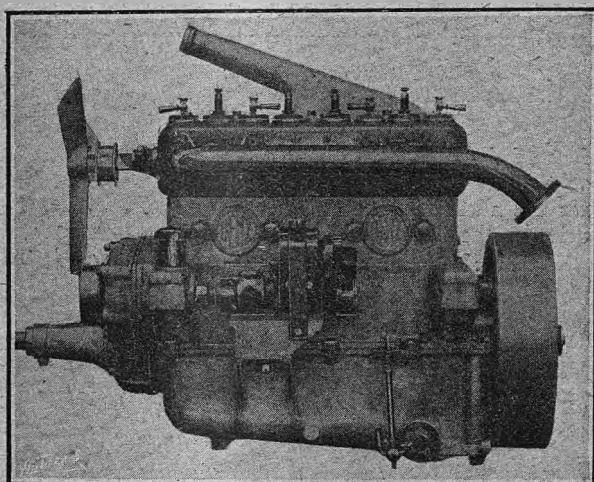
Four Cylinders, 72 × 120 mm. Four Speeds. Bevel Drive.

THIS well-considered car, the production of the renowned German firm, can be seen in chassis form at the establishment of the British concessionaires, the Brompton Motor Co., 78-84, Brompton Road, London, S.W.

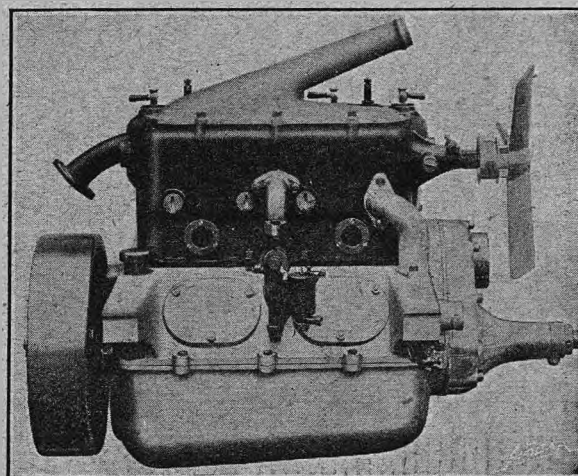
The frame is of stiffly-sectioned channel steel, with a channel section cross member immediately behind the radiator. The engine is carried directly by the crank chamber brackets from the side members, and the gear box from two cross channel section members. The rear of the frame is stiffened with large angle plates.

The four 72 mm. × 120 mm. cylinders of the engine form a compact *en bloc* casting, with the valves on the

from the shaft to the armature spindle is through a single-jawed dog, which aids the correct replacement of the magneto after removal. The pistons have three rings above the gudgeon pin, and the inside of the crown of the piston is formed with an oil drip serving a splayed orifice in the upper part of the little end.



A near side view of the 12-20 h.p. Benz engine.



The off side of the 12-20 h.p. Benz engine.

Thermo-syphon cooling is adopted, the delivery and outflow being kept exceedingly short.

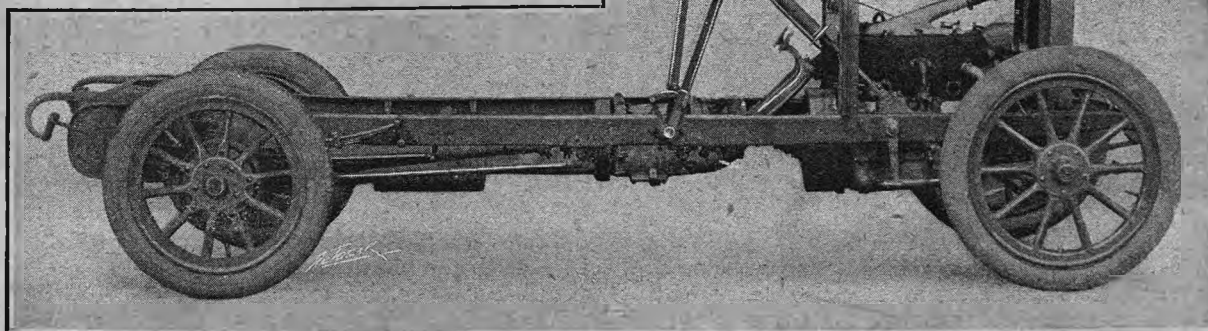
The Zenith carburettor, which is placed on the off side of the engine, is kept well up in an accessible position, mixture leads being formed in the cylinder casting from the point where the induction pipe flange occurs. Two large inspection covers are provided to the right hand raked face of the upper portion of the crank chamber, through which the big end bearings can be easily examined.

Forced lubrication is provided, a filter guarded sump being formed in the lower half of the crank chamber, from which oil is drawn by a direct acting pump operated by the camshaft, and which delivers oil to a sight feed on the dashboard and to the crankshaft and big end bearings. The camshaft, tappets, and cylinder walls are lubricated by the spray thrown from

left hand side, the tappets and stems being enclosed by easily detachable cover plates. The valve stems and tappet guides are of good length, the tappets making contact with the cams by means of hardened steel rollers. The tappets are, of course, adjustable.

The camshaft runs in three bearings, and the camshaft and magneto driving shaft are driven by a single silent chain, which has an easily operated eccentric adjustment. This takes the form of an eccentric block in which the bearings of the magneto driving shaft are carried.

The Eisemann magneto is set upon a special table cast on the lower half of the crank chamber, and has its working face fairly accessible. The drive

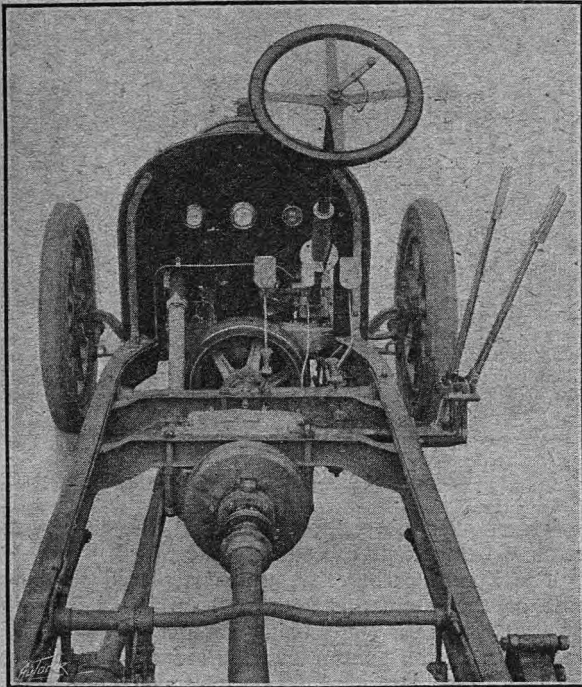


The off side of the 12-20 h.p. Benz chassis.

The 12-20 h.p. Benz.

the connecting rod ends. A neat and simple form of high and low level test cock (shown in an accompanying sketch) is attached to the outside of the crank chamber for the purpose of testing the oil level in the sump. The oil filter in the sump is easily detached from without for cleaning.

The drive is transmitted to the gear box through a leather faced pressed steel cone clutch, very light in construction, and fitted with first intention springs beneath the leather. The clutch sleeve is fitted with ball thrusts, and a most effective form of clutch brake



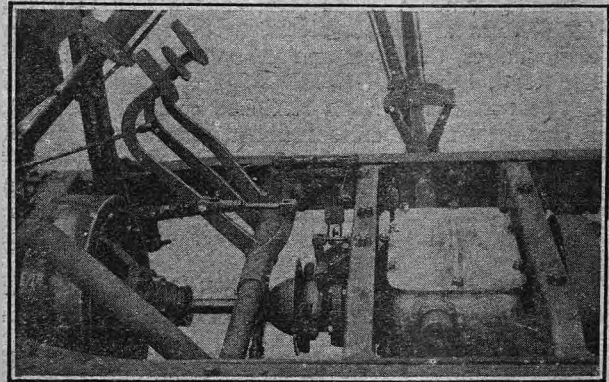
The centre portion of the 12-20 h.p. Benz, showing the brake drum at the head of the propeller-shaft, the clutch, the control pedals, and the fittings on the dashboard.

is provided. In the gear box the shafts are short, the gear wheels of good width, and the teeth of stout section. The shafts rotate in ball bearings, and the gearing affords four speeds with a neat and easily operated form of gate change. The side brake spindle runs through the gear striking sleeve and the pedal-operated brake spindle through the gear box. The top or fourth speed is of the internally toothed order, as opposed to a dog clutch. Both shaft and wheel brakes are of the internal-expanding order, and take effect upon drums of good width and diameter.

Prosecutions at Deganwy. Magistrates' Advice to the Police.

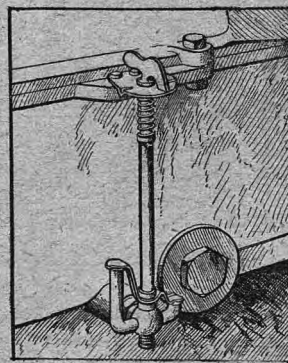
Quite a number of motorists were prosecuted and fined recently for driving through the main street of Deganwy (between Llandudno Junction and Llandudno, North Wales) at a speed in excess of the ten-mile limit, the fines ranging from £1 and costs to £2 and costs. All the cases were noted on the afternoon of the same day, and the timing was carried out by the same policeman by means of a stop watch. One of the defendants who drove a car along the road at 20½ miles per hour, according to the constable, stated that he had a good speedometer on the car and kept his eye on it, and the needle did not indicate a speed of more than 11 m.p.h. The officer, he submitted, could not work the "trap" alone, as he could not be

The front universal joint of the propeller-shaft is encased in a socket formed on the web of the brake drum; the propeller-shaft is carried in a tapered tubular steel casing, flanged and bolted to the forward



The clutch and gear box of the 12-20 h.p. Benz, showing the double pad clutch stop at the rear end of the universally jointed clutchshaft.

face of the differential gear casing. The forward end of this tubular casing is provided with ball bearings for the additional support of the propeller-shaft. The drive to the back axle is through bevel gearing in the ordinary way. The differential case is split vertically, and the live axle casings are flanged and bolted thereto. The road wheels rotate on ball bearings.



Sketch showing the oil level test cock on the crank chamber of the 12-20 h.p. Benz. It will be noticed that the two-way cock has high and low level outlets.

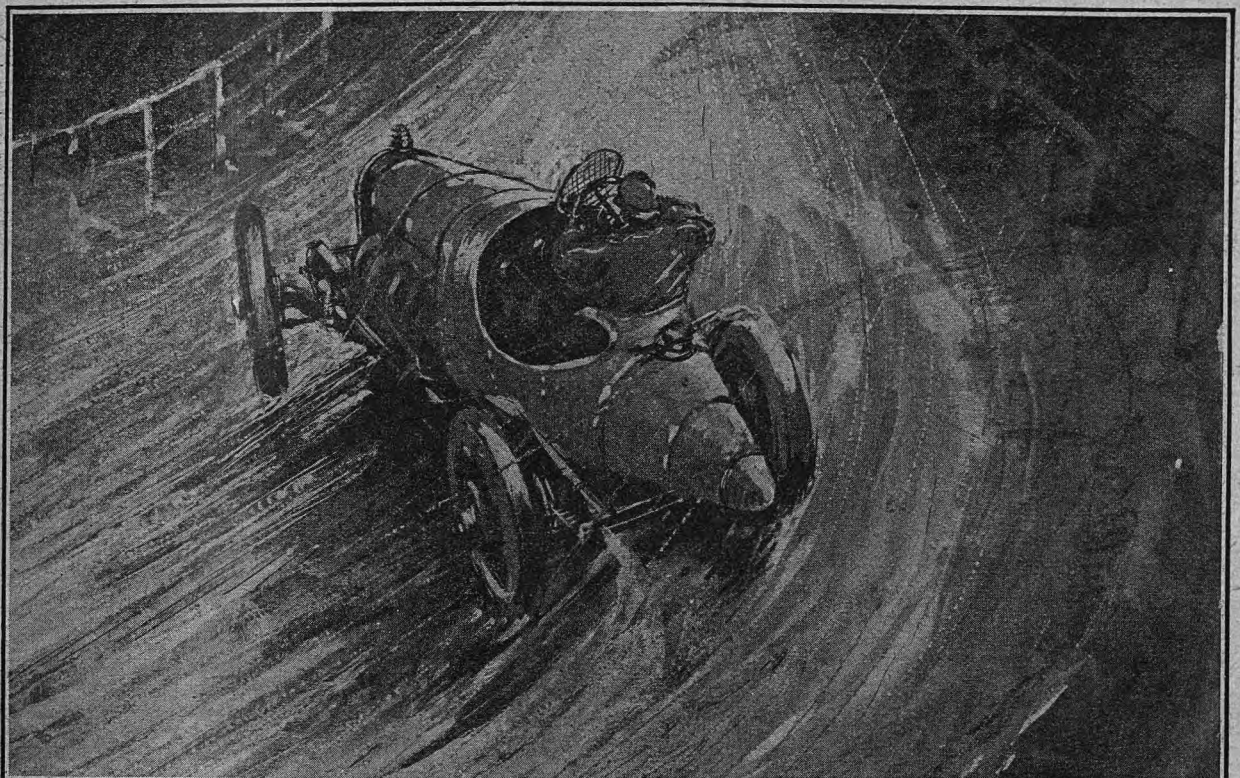
The frame is carried on semi-elliptical springs fore and aft, the rear pair being doubly shackled, for the back axle is provided with pivoted radius rods running forward to a connection with the frame in transverse alignment with the universal joint.

Lubricators are provided to the journals of the spring tables, where these are carried on the axle sleeve. The pressure petrol tank is placed at the rear of the frame.

The wheel gauge of the chassis is 4ft. 2in. and the wheelbase 9ft. 6in., while the wheels are 810 x 90 mm.

sure when the cars entered the limit area, and also there was another car just in front of the defendant's, and it was that which the policeman really attempted to time. The Chairman of the Bench said that the magistrates would give the defendant the benefit of the doubt, as they considered that there should be two stop watches, so that the time could be taken when the cars entered the "trap" and when they left it. Had the other defendants not admitted that they had considerably exceeded the limit they would have dismissed the other cases. They hoped that in future if the police had any "traps" to set for motorists they would see that a proper method of timing was adopted.

Cornering at Shelsley Walsh and Aston.



Two of the fast cars at the Shelsley Walsh hill-climb on the worst corner of the hill, drawn from opposite points of view. Above, Mr. C. A. Bird's Coupe de l'Auto Sunbeam; below, Mr. Oscar Cupper's Prince Henry Métallurgique. Strangely enough, Mr. Oscar Cupper's car assumed almost the same attitude at Aston at the top corner; in this case the corner was not so sharp or so steep, but the speed was higher, so that the optical result was much the same.

Leaves from a Sportsman's Notebook.

By J. Fairfax Blakeborough.

WE have had more summer sunshine during the few days prior to my writing these notes than we had all last year put together. The result has been that many of us have been irresistibly called to the waters' edge, and the cool woodlands through which those waters flow, to follow the summer sport of otter hunting. This is an ancient pastime which, in recent years, has received a fillip of support from those who love the cry of the hound and the sound of the horn together with the company of congenial spirits. Ottering constitutes a sort of open air sporting club whose members have a sort of *entre* to the most beautiful and sequestered parts of rural England—by river and rill, through forest and by old farmsteads and picturesque mills, through scented clover-fields and wondrous rock-gardens planned out by nature—the best scenic gardener of all. Yes! there is a charm of *locale* about otter-hunting which cannot but appeal to one, and to that charm is added an objective without which so few folk will leave the beaten paths. To the motorist the chase of the otter has one advantage over the winter sport with the fox. The car plays an important part in both, but in the case of the latter the remark of an old friend of mine has always to be remembered when giving orders for the car to be taken to such and such a place to await the arrival of the owner and his family or friends in the evening. My friend often used to say in the broad Yorkshire vernacular, "Ya know where ya start a day with fox-hounds, but only the Lord above knows where you'll finish it." The M.F.H. may plan out the route he intends to draw during the day, but he cannot arrange which way foxes will run. The direction of the wind, the customary route foxes take from certain coverts, well-manœuvred schemes for making foxes break towards the point most desired, all these may be taken into consideration and the motorist may still find himself so many miles from his car at dusk-fall that it is easier for him and his horse to hack home than ride to the waiting motor. Over and over again during the winter does this happen, and it is quite unavoidable and is part of what has been described—and rightly described—as "the glorious uncertainty of the chase." Now with otter-hunting matters are different. Though otters do occasionally take to the land and travel for some distance across country (their number is usually up when they do so with hounds behind them), the course of the river may be taken as the course which will be followed, and it is easy to obtain information as to how far the water will be drawn each day and the car may then be sent on to the terminating point or to an intermediate stage, there to await the luncheon hour. It has come to be looked upon as almost a natural course for those who possess motors to provide refreshments for those who do not. Thus is it that at luncheon time the little collection of cars are surrounded by the friends of the owners, and, for the nonce, they become a sort of travelling eating house *pro bono publico*.

Possession Nine-tenths, etc.

It is an old saying that possession is nine-tenths of the law. That odd tenth, however, very frequently causes a very great deal of trouble. Mention in the foregoing note of one's friends commandeering the car-commissariat department on otter-hunting days reminds me of an incident which occurred to a

trainer friend of mine and myself a short time ago. I had been staying with him for some days, and one morning we motored from his hill-top training establishment to the station eight miles away. We took the stable jockey with us, and left the car at an hotel quite close to the station. After racing we missed the first special train home owing to the motor omnibus from the course breaking down. On arriving at the home station we walked across to the hotel for the car and found that the stable jockey had departed with it an hour previous. My friend was furiously angry. He saw no humour in the situation, and his temper was not improved as rain began to fall. We tramped the eight miles in silence, only broken by threats and curses. When we at last reached the summit of the hills and the trainer's house he asked for the jockey with his first breath, and finding he had gone to bed he interviewed him in his bedroom and gave him a warm ten minutes. Personally, I am not one of the best tempered of men, and I should have been exceedingly annoyed at an employee taking such a liberty, but my rage would not have lasted and fermented for eight miles, though I should have given very definite orders for the future. Some one said to me the other day that "jockeys and parsons imagine anything becomes them," and it is true that the world allows both a considerable amount of latitude.

Cars and Foxhounds.

Apart from their work in the field, the foxhound is one of the most phlegmatic, lethargic, seemingly brainless, lacking-in-determination species of the canine genus. Motorists know this as well, if not better, than most folk; for just when they think their course is clear young puppies (out at walk) suddenly seem to be seized with a fit of suicidal mania and rush in front of the car, the driver of which has been careful steering out of their way. It is in this manner that a number of young foxhounds, out in their summer quarters are killed each year. The epoch of danger is now again at hand, but up to the time of writing no masters of hounds have written me (as in previous seasons) to tell me of fatalities or even injuries. At a critical moment children and puppies are more exasperating, to those who are endeavouring to avoid doing them hurt, than sheep or pigs—and that is saying much. Mr. John Brown, the famous Yorkshire hunter-dealer and breeder, and myself a few days ago spent some time in endeavouring to drive some pigs from the attacks of a number of open-mouthed and light-footed young horses, but the swine would go anywhere except through the door of safety for about ten minutes. Walking a foxhound puppy is looked upon as equal to a £5 subscription each year to the hunt, and the army of puppy walkers are most important to the success of every pack. I have walked puppies and I am a foxhunter, but am bound to admit that young foxhounds are a great nuisance to a locality, even though they add colour and tone to it. It was Will Ogilvie who so well pictured the feelings of a man who had walked a hound for the first time.

"But the days went by and the puppy grew,
And broke the commandments and stole and slew
And covered the lawn with a varied loot,
Of fowl and feather and bone and boot,
And scratched in the garden a hundred holes;
And wearied our bodies and damned our souls,
As we chased him over the plots and swore
There was 'walking a puppy' for us no more!"

The 15-30 h.p. Sleeve-valve Argyll.

The Impressions of a Week-end Run. By Page.

“OUT of evil cometh good”—so 'tis said, and the evil, so far as motorists are concerned, has to do with unjust taxation, the high price of petrol, and the increasing cost of motor accessories generally; the good which has resulted is seen in the wonderful development of the smaller bore (65 to 80 mm.) internal combustion engines. As a result of the invasion of the cheap American cars having powerful engines in light chassis, the British manufacturer was obliged to set about producing a car on which the tax was not too heavy, which could be run at a moderate cost, and was possessed of a highly efficient engine of small or moderate bore.

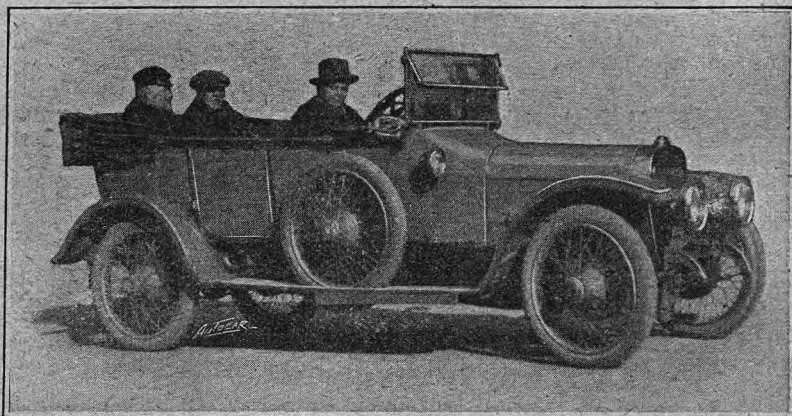
Our manufacturers have responded nobly to the call, and now the motorist is in the happy position of being very unlikely to make a mistake in purchasing any car of British manufacture. Those who have gone through the mill in motor matters will remember that not so long ago the small car practically did not exist; one met on the road thirties and forties mainly of foreign origin. Now, however, the energy and ability of our own manufacturers has changed this, and we Britishers should feel proud of the improvement and efficiency of the smaller bore engines. For it must be remembered that the 12 and 14 and 15 h.p. cars of to-day are doing what the 30 and 40 h.p. cars of some years back were capable of, with much less fuss and at a mere fraction of the cost.

The technical details of the sleeve valve 15 h.p. Argyll were fully discussed in a recent issue of *The Autocar*, so that reiteration of these is unnecessary; likewise the *ensemble* of the cars made by this firm is so well known that one need only state that body and coach work are Argyll to convey an impression of excellence. In trying a new car, the first impressions have more importance than is usually credited to them; as remarked previously in my experience of the 25 h.p. Argyll; when one feels comfortable in the driving seat to start with one instinctively forms a favourable impression right away, yet the seating accommodation in this vehicle passes from the stage of comfort to that of luxury. The Argyll car sent me for trial had for its power unit sleeve valve engine No. 1, on which much of the experimental work was done, and it may be stated at once that this engine is a credit to its designers and producers.

My week-end experience of the car was uneventful: the car did all it was asked to do and did it well, the running included very steep hills and cut up roads, which were negotiated satisfactorily. An important point worthy of mention was the very perfect carburation at all speeds; the car had been very carefully tuned up, and the Zenith carburetter functioned in a most delightful fashion. Starting on second speed, top gear was reached in a matter of a few yards, and unless for a pretty steep hill it was unnecessary to come off top. I am no advocate of the “all on top” proposition—if gears are provided they are intended for use, not for ornament. Needless to remark, a good driver who is fond of his car tries as far as possible to

keep his engine speed a constant within certain reasonably defined limits.

Another prominent feature was the total absence of periodicity in any shape or form; the experienced driver will have noticed in some cars a certain speed at which the engine, sometimes the whole vehicle, becomes uncomfortable from an engineering point of view. A period may occur, for example, in sudden acceleration, or when going all out, giving one the extremely unpleasant sensation that everything in and about the car is on the “rattle.” With the 15 h.p. Argyll engine, however, one cannot produce the



The 15-30 h.p. 80 x 130 mm. sleeve-valve Argyll car referred to on this page.

slightest suspicion of periodicity. The acceleration is not of the extremely rapid order—not like the 25-50 h.p., for example—but it gets there all the same.

The Alexandria firm have still retained that remarkable fondness for an excess of air in their tyres, and had it not been for a pair of very good shock absorbers the running at times would have verged on the uncomfortable. The 815 x 105 mm. tyres also I consider undersized. What with the engine that pulls like a 30 h.p., the weight of the car unladen—28 cwt.—and five hefty Scots averaging 11-12 stone apiece, it was just asking a bit too much of 105 section. I understand, however, that the 820 x 120 mm. is the standard for this chassis; if this be the case the running will be improved. The steering wheel has the sensation of being insulated from road shocks, thus rendering a long drive free from arm weariness in any shape or form; the diagonal system of braking is extremely effective.

In conclusion, I make no hesitation in stating that this is by far the best 15 h.p. car I ever handled; it pulls like a 30 h.p., and, as a matter of fact, the brake tests give a showing of something over 53 h.p. It has a duplicate of the record breaking Argyll engine except for the lighter pistons and connecting rods.

The automobile exhibition in St. Petersburg is proving a great success, judging from the reports to hand. The Czar, on his return from the wedding festivities in Berlin, visited the show, as a result of which the aristocracy of the Russian capital have been quick to follow the royal example. It is a pity that more British firms did not participate in the show, at which both German and French manufacturers—particularly the former—make a very large display.

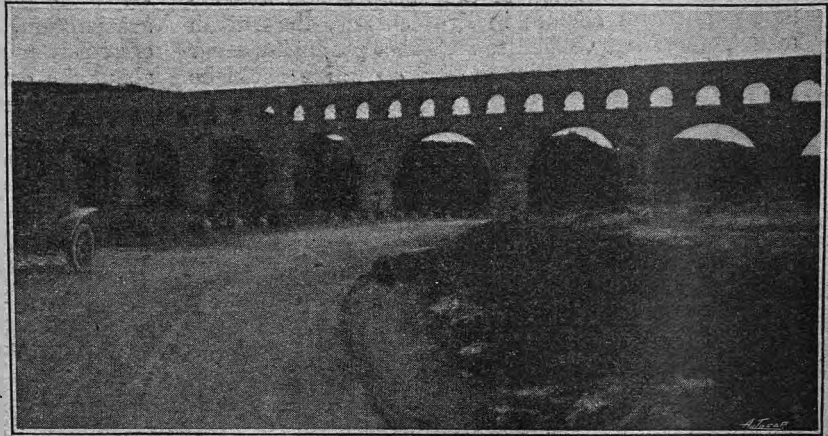
A Spring Tour in France.

By Owen John.

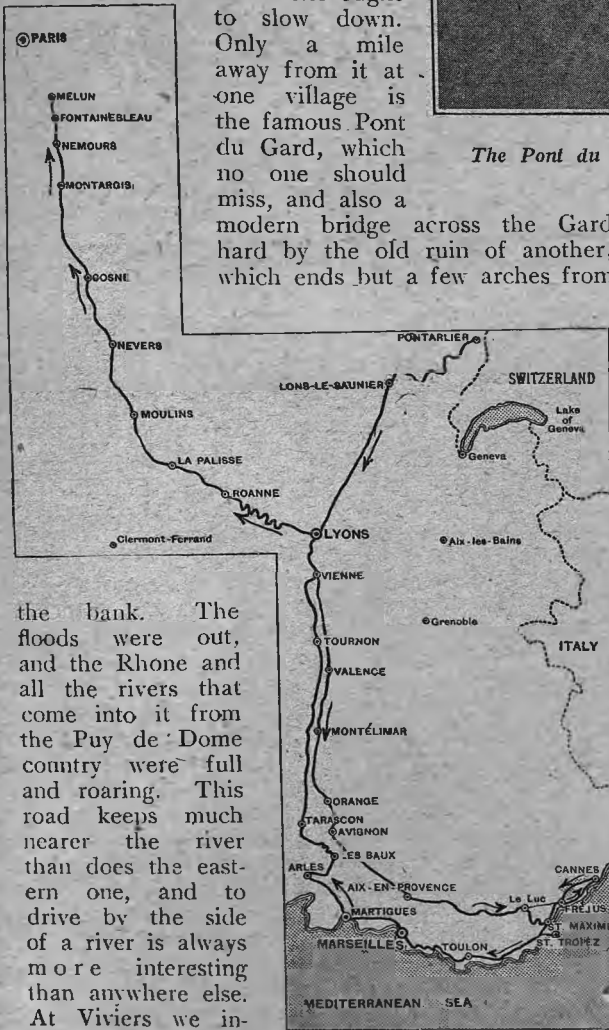
(Concluded from page 1071.)

From Tarascon it was our intention to run north to Lyons along the more unfrequented road on the right or western bank of the great river, and, though we crossed it that night in order to sleep at Montélimar, we thoroughly carried out our task. Without being wildly exciting, it is a great improvement on the usual road, no longer, and has easier gradients and an infinitely better surface. It is not nearly so wide or so open, but that is almost an advantage, and except for the cement works at Le Teil and the nuisance of too many level-crossings, it is much pleasanter. Certainly there are more *cassis*, but these are all marked, and only occur in villages where one ought to slow down. Only a mile away from it at one village is the famous Pont du Gard, which no one should miss, and also a modern bridge across the Gard hard by the old ruin of another, which ends but a few arches from

fully on hotels later on. The next day was fine, so we resumed, and, keeping along the west bank, we passed many interesting places, notably Rochemaure, an ancient castle perched high on the red mountains



The Pont du Gard, the famous Roman aqueduct which lies about a mile off the route described.



the bank. The floods were out, and the Rhone and all the rivers that come into it from the Puy de Dome country were full and roaring. This road keeps much nearer the river than does the eastern one, and to drive by the side of a river is always more interesting than anywhere else. At Viviers we inspected its fine Cathedral and its famous Gobelin tapestry, after which we crossed the Rhone and bumped to the very comfortable Hotel des Princes at Montélimar, along a truly shocking thing in roads. Here was luxury, and for eight francs we found a big bedroom with two beds and a bathroom attached. But I dwell more

above us, with fortifications extending *à la Carcassonne* down to the river below. But the day was Easter Monday—the only real Sunday, I am told, in all the year in France. And all the inhabitants were in the streets of all the many villages. Then my clutch began to slip, and we came to Lyons. Being Easter Monday, of course, everyone was away, so we abode at the Hotel d'Angleterre—quite moderate and very pleasant—and waited for Tuesday to get it corrected. Also it began to rain again.

We were in luck at Lyons, for there was an automobile exhibition going on. Of course, we went, and we saw wax men in pink coats and gaiters in motor boats, in aeroplanes, and in Turkish baths. There were stalls of pneumatic cleaners, corsets, gambling machines, shock absorbers, double eyeglasses, scent sprays, fishing rods, toy butterflies, guns, and all sorts. But there was not much of a crowd, indeed some stallholders covered up their wares and departed, while one, in despair, took lessons in typewriting from his pretty typist. There were a great many officials with beautiful blue and red armlets, and a string band. This latter was much annoyed by a blatant steam organ belonging to a circus pitched just outside the canvas walls of the temporary building. But I must not forget the cars. To say nothing of the ubiquitous Ford, there was a Daimler. Also about ten other makes and some very smart bodies. Visitors took more notice of the aeroplanes, one of which had been cruising about outside in the afternoon, and a man who had brought the art of flying toy ones to perfection had a large crowd around him all the time. I stole a Benz catalogue because of the frontispiece in it, and we left early. What good that show does to Lyons, automobilism, or its exhibitors I do not know. There is an equally good motor show always open at any big garage.

Although in England the natural corollary to one wet day is another, in France very often it is other-

wise. Therefore the next day came out fine, and we made off over the hills in a W.N.W. direction for Roanne to cut into the *route nationale* that runs from Paris to Marseilles *via* Ste. Etienne. By going through Lyons we had avoided the high ground under Mont Pilat, which is a point worth consideration in the spring and winter, and we could see as we got on to the "Great Divide" between the water-sheds of the Loire and the Rhone—the Atlantic and the Mediterranean—behind us to the South the high white mountains still under snow. But it is a pleasant, picturesque, and well-graded road, with an excellent surface, and a car that climbs well rejoices in its cunning loops and turns. At Roanne we joined the *Route Nationale* No. 7, and from here, through Lapalisse, Moulins, Nevers, to Cosne, the highway is wide, open, easy, and altogether delightful.

Owing to my laziness and the Bank Holiday at Lyons, my clutch began to slip again, and so at Lapalisse I called on a garage proprietor—marked A.A. in the *Guide Michelin*—and requested him to wash the leather of the new invention and tighten up the adjustment. We spoke politely, but, to our surprise, he turned his back on us and loafed into his garage. I told him what I thought of him in bad French, and, also, that it served me right, perhaps, for putting any reliance in English initials, and we went on to Moulins, where at M. Chapier's establishment all was made perfect in less than no time and I was only charged the very reasonable amount of one franc for the job.



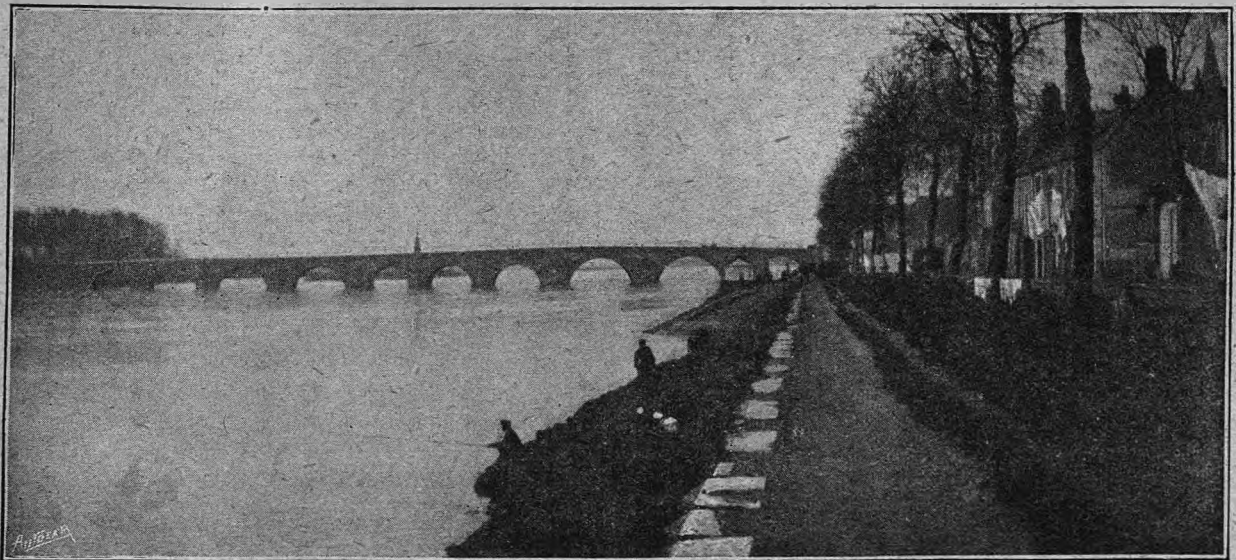
The old castle of Rochemaure.

From Roanne we had run all that day by the side of or near the Loire, and it is very curious to note how different our surroundings were from those of the banks of the Rhone. But the improvement was for the better, and the Zedel went like a bird up the long straight stretches, and we were at Cosne long before ever we had intended. Here at the Hotel du Cerf—one of the winners of the T.C.F. hotel prizes—we found everything one could desire in the way of comfort, and so ended our last night on the road.

We were but a hundred and twenty miles from Paris, and I calculated on reaching it in the early afternoon. But calculations are rotten things, for it began to rain at nine o'clock, and though we waited at Cosne till eleven, and, after lunch, at Montargis till after two o'clock, it only got worse and worse.

At Fontainebleau we were wet through, the colour of our hats—we had no hood—was on our faces and down our necks, the rain had blown up my sleeves, and I was truly miserable. We drove into it through the vast forest, and when we got to Melun we gave it up as a bad job, put the car in the nearest garage, advised the Zedel people that we had left the car at Melun, and caught the next train to Paris, London, and finally arrived home.

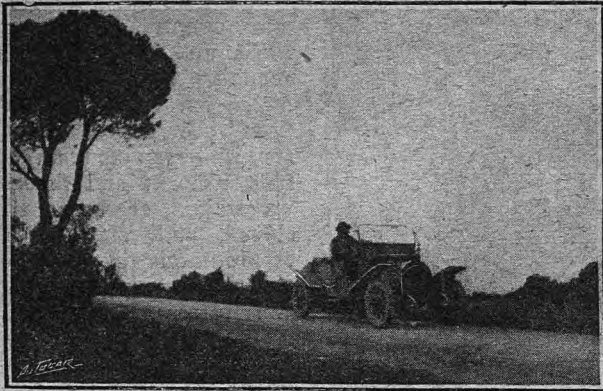
We had run nearly a thousand miles altogether and enjoyed every yard of it. Deducting the price of our tickets and the extras at Cannes, our expenses were ridiculously small, petrol perhaps at an average of about two and twopence a gallon being the largest



La Charite, on the banks of the Loire.

A Spring Tour in France.

item. Garage for the night had been free except at Cannes, Bourg, and Marseilles. Clutch troubles, through my ignorance, and a broken floorboard were the only extra expenses. We never stayed at a bad hotel or one which came to more than anticipated, and our only really wet day was our last. For the sake of comparison and to astonish our native hotel keepers, I append a list of charges taken directly off carefully preserved bills. I have not put down such items as coffee, liqueurs, or baths, because sometimes we took the former elsewhere, and the latter did not exist, or existed only as a ceremony at the cost of 2.50. With regard to sanitary arrangements every hotel we stayed at was complete, and our bedrooms in each town left



"On the road."

little to be desired. Of course, some were better than others, but all were clean, and, as a rule, provided with radiators which one could turn off and on.

Here are the names and the prices charged for two people.

PONTARLIER : HOTEL DE LA POSTE.	
Rooms	8 francs
Two <i>petits déjeuners</i>	3 "
Two dinners	7 "
BOURG : HOTEL DE FRANCE.	
Rooms	9 francs
Two <i>petits déjeuners</i>	2.50 "
Two dinners	8 "
VALENCE : HOTEL D'ANGLETERRE.	
Rooms	7 francs
Two <i>petits déjeuners</i>	2.50 "
Two dinners	7 "
AVIGNON : HOTEL CRILLON.	
Rooms	10 francs
Two <i>petits déjeuners</i>	3 "
Two dinners	8 "
STE. MAXIME : GRAND HOTEL.	
Rooms	10 francs
Two <i>petits déjeuners</i>	2.50 "
Dinners	8 "

CANNES : HOTEL SPLENDID.	
Rooms	12 francs
Two <i>petits déjeuners</i>	4 "
Two dinners	12 "†
Four lunches	20 "†

†Most excellent meals in every respect.

ST. TROPEZ : GRAND HOTEL SUBE AND CONTINENTAL.	
Rooms	5 francs
Two <i>petits déjeuners</i>	2 "
Two dinners	7 "

MARSEILLES : HOTEL BRISTOL.	
Rooms (with bathroom)	8 francs
Two <i>petits déjeuners</i>	3 "
Two dinners	10 "

LES BAUX : HOTEL DE LA REINE JEANNE.	
Rooms	8 francs
Two <i>petits déjeuners</i>	3 "
Two dinners	10 "

MONTELMAR : HOTEL DES PRINCES.	
Rooms (with bathroom)	8 francs
Two <i>petits déjeuners</i>	2.50 "
Two dinners	8 "

LYONS : HOTEL D'ANGLETERRE.	
Rooms	8 francs
Two <i>petits déjeuners</i>	3 "
Two dinners	8 "

COSNE : HOTEL DU CERF.	
Rooms	8 francs
Two <i>petits déjeuners</i>	3 "
Two dinners	8 "

Cheap enough, when one remembers that a *franc* is only tenpence, and, except in large towns or at watering places, wine is included.

At no hotel had one to complain of anything, and it was a pleasure, after paying the account, to tell the proprietor that his moderate charges would see the light in the motor journal with the biggest circulation in the world. Sometimes his—or her—cheek blanched. He hoped I did not consider the bill excessive? I invariably reassured him—or her—that it was quite the other way, and I only hoped they would not raise their prices because of my eulogy.

I have now come across France in cars some dozen times. Each time the pleasure of staying in little country hotels increases, and I have not found—except in the towns on the shores of the English Channel—that there is any desire to charge more than formerly. One still gets invariably the best of attention and the friendship of the proprietors, and, except in the larger hotels, the crowd of menials on the lookout for tips for nothing does not exist. The servants that expect tips in French provincial hotels are those, and those only, who have done something for one, and they always appear thankful even for small mercies.

May I conclude by remarking once more that to tour in France in a motor is one of the most economical forms of enjoyment that exists—as long as one avoids fashionable towns and hotels with lifts and liveried hall porters. Even then it is not more ruinous than at home.

Autocure.

"Autocure" is a tyre patching compound now being put upon the market by the North British Rubber Co., Ltd. It is claimed to be unique both in respect to its self-vulcanising and adhesive properties, and, indeed, unless it was suitable for this purpose in every way, it would not be put forward for the purpose by the North British Rubber Co. The great difficulties hitherto associated with tread filling and patching compounds, namely, the length of time required to dry, and the unreliability of the material to remain in the

cuts and so seal them against the intrusion of moisture and grit, are claimed to have been successfully overcome by the introduction of Autocure. Practical motorists know that nothing is more injurious to a tyre than the neglect of cuts in the tread. Unless these receive proper attention grit and damp work into the tyre and sooner or later—probably sooner than later—produce decomposition of the fabric and disintegration of the rubber to the ultimate destruction of the tyre and the dismay of the car owner.

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.

THE ROYAL VISIT TO LANCASHIRE.

[19664.]—Their Majesties the King and Queen will be touring in Lancashire by motor car from the 7th to 14th July next.

The various routes by which they will travel, together with the approximate times of starting and finishing, are shown on the enclosed list.

Their Majesties' motor car will carry the Royal Standard, and, to prevent confusion, it is earnestly desired that motorists should refrain from carrying any flags on their own private cars when travelling in this district during the time of Their Majesties' tour.

Moreover, I should be glad if motorists would, as far as possible, avoid using the roads over which Their Majesties will travel on these particular dates, and, if obliged to use them, it would greatly assist the police if they would pay prompt attention to directions given by those on duty as to pulling up to allow Their Majesties free and uninterrupted passage.

Further, I would warn you that in boroughs through which Their Majesties pass, the roads will be closed to all vehicular traffic for two hours or more, pending the passage of Their Majesties through the borough.

I should be glad if you would publish this, together with the enclosed routes and times, in your columns.

H. P. LANE (Chief Constable).

MONDAY, 7TH JULY.

Warrington 3 0 p.m.
via Penketh to Widnes and *via* Huyton
 Knowsley 5 15 p.m.

TUESDAY, 8TH JULY.

Knowsley, depart 10 0 a.m.
via Prescott to St. Helens, and *via* Rainford
 Ormskirk, and Southport to Preston 3 45 p.m.
via Kirkham, Lytham, and St. Annes to Black-
 pool 6 0 p.m.

WEDNESDAY, 9TH JULY.

Cole 11 15 a.m.
via Nelson, Brierfield, and Burnley to Gaw-
 thorpe Hall 2 15 p.m.
via Padiham, Clayton-le-Moors, Accrington,
 Haslingden, Rawtenstall, Bacup, Whit-
 worth, to Rochdale 6 0 p.m.

THURSDAY, 10TH JULY.

Earlestown 10 30 a.m.
via Newton-in-Makerfield, Ashton-in-Maker-
 field, Abram, Hindley, Higher Ince, Wigan,
 Chorley, to Houghton Towers 2 0 p.m.
 Blackburn, Darwen, Egerton, to Bolton 5 15 p.m.

SATURDAY, 12TH JULY.

Ashton-under-Lyne 10 45 a.m.
 Oldham, *via* Chadderton to Middleton, *via* Top
 of Hebers to Heywood and Bury 3 0 p.m.
via Whitefield, Radcliffe, Little Lever, Farn-
 worth, Kearsley, Swinton, Eccles, Worsley,
 Tyldesley, Atherton, Leigh, West Leigh 5 35 p.m.

MOTOR SPIRIT MADE AT HOME.

[19665.]—In reply to "H.O." [letter 19634], I am enclosing a copy of the Custom Authority's letter in reference to the use of stills by private persons in the production of distilled water.

As those precautions are drawn up with a view of preventing unscrupulous persons from using the still for illicit purposes in producing alcohol, it must be admitted that these precautions are necessary as regards a drinkable intoxicating spirit. Alcohol is a fermented and distilled product of organic nature from the cereal and vegetable world—potatoes, beetroot, barley, peat, etc.

When we come to the spirit produced from the inorganic or mineral world, as coal, shale, tars, paraffin, or petroleum, we have a spirit equally as potential as regards power, but by no stretch of the imagination would anyone think of saying that it was an alcohol. If the same restrictions were placed on mineral spirit as on alcohol, petrol would be from 10s. to 20s. per gallon, even without the aid and inflation in price of the petrol rings. Every gasworks and blast furnace would have to stop making benzole, and the petrol rings would have to look for a new monopoly in power, as steam, liquid air, or electricity, or shut up their octopus networks.

If the motor public throughout the country were to combine in each district, study the waste hydrocarbon products of their neighbourhoods, and erect plant to work them in competition against petrol, the price of that spirit would fall to one-half its present inflated price where they found opposition. There are millions of tons of low-grade coal, coal dust, shale, etc., not worth carriage from the pit mouth at present, but of more value than the best Silkstone or Wallsend if converted into motor fuel.

Apart from this, each small local gasworks has coal gas residues and waste too small in quantity to warrant the erection of plant to produce benzole itself, but which could be collected by a motor fuel plant operating in the district or county.

Other sources of hydrocarbon fuels suitable for motors are the benzoles given off in the production of coke for steel smelting, and by the use of more economical ovens this spirit could be doubled in output, but even now it amounts to many million gallons per year.

A few years ago (1903) petrol could be obtained in bulk below 8d. per gallon, whilst now it has risen to a considerably higher figure, and the price will probably be forced up until other carburetted material is brought into competition with it.

The high price is largely dependent upon the supply of petrol being in a few hands. Most of that derived from American oil is needed in America, whilst Russian oil yields but a small percentage of the most volatile spirit. The result is that the bulk of the English supply comes from less prolific, but equally well controlled, sources as regards monopoly.

In conclusion, I can only say that if the motor public would follow the lines laid down here they not only could produce a British-made fuel and employ British labour and capital upon it, but they would have sufficient waste hydrocarbon residues in the country to keep petrol at a normal and reasonable price for the next fifty years. W. HIGGINS.

The copy of the letter from the Custom House which our correspondent enclosed states: "The practice of the Board of Customs and Excise is to allow the use by private persons of stills of which the actual capacity does not exceed one gallon, for the sole purpose of producing distilled water, subject to the condition that the still is accessible at all reasonable times to inspection by any officer of Custom and Excise."

GEAR WHEELS WHICH JUMP OUT OF MESH.

[19666.]—Referring to "Useful Hints and Tips" in your issue of June 14th, and the remarks of your contributor "W.E.," the difficulty arising from the jamming of a locking rod due to imprisoned grease in the closed end of the rod bearing, which prevents the notch on the rod being brought under its spring plunger for locking the selected gear, can be obviated by a better means than that described, viz., drilling a hole through the closed end of the bearing so that the grease is forced out of the gear box. A better way still is to cut a narrow groove lengthways, either in the bearing or on that portion of the rod that passes through it, so that the grease when compressed can find its way back into the gear box, and not be lost or make a mess in the under shield. Also *apropos* of what is said with regard to the dog clutch of the direct gear becoming disengaged,

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owing to wear of the striker fork and the rounding off of the edges of the small sliding gear wheel and annular teeth, it may interest your readers to know that there is a dog clutch in which this can never occur. This dog clutch when once meshed cannot be disengaged as long as power is passing through it, and can only be released by either throttling down or declutching the engine.

It has several other interesting features, the main one being that it can be manipulated by the veriest tyro without the slightest fear of damage, because when the parts are brought into engagement, if the speeds of the gear box, main shaft and clutch shaft are not approximately equal, it acts as a clutch stop, and synchronises their speeds until it is able to mesh, which latter operation it performs automatically. It also automatically locks itself when out of mesh, so that it cannot accidentally engage, and requires no more space in a gear box than is at present available.

R.C.W.

THE AGE OF SECOND-HAND CARS.

[19667.]-"Perplexed" [19651] is a buyer, which, perhaps, accounts for his perplexity. All buyers regard age and condition as synonymous terms, which no doubt constitutes one reason for not advertising the date of manufacture. There is always the possibility that a buyer (if in the seller's neighbourhood) may be tempted to inspect a car which is undated, but for an advertised three-year-old he would scarcely trouble to cross the road. I have recently attempted the sale of a small Rover car, which, though faultless in every other respect, is suffering from *anno domini*. This fact, when disclosed, has proved sufficient to choke off all buyers, in spite of every facility for expert examination.

BERKS.

[19668.]-Letter No. 19651 raises the question of the great variation in prices of second-hand cars, and "Perplexed" suggests advertisers should state the age of the car. I consider this to be a great mistake, because there are cars five, six, and seven years old which are in a far better serviceable condition than many which are only two years old. In my experience, which is very extensive, there is only one way of buying second-hand machinery safely, and that is to have it thoroughly scrutinised by competent parties whose judgment is not affected by commissions, but who are paid by the purchaser only for their services.

A. E. PARNACOTT.

A NEW GOSPEL OF LUBRICATION.

[19669.]-With regard to Mr. Kirke's letter [No. 19619] under the above heading, your correspondent is quite correct in stating "that the graphite does not settle in the oil." As a matter of fact, Oildag does not mean the suspension of graphite in oil, and it is rather doubtful whether the vibration of the car is sufficient to keep it thoroughly mixed. This is important, as, after having the car standing still, the Oildag will sink to the bottom. But there is another product in the market called Graphite Oil "G" brand, which contains absolutely pure graphite suspended in it. If Mr. Kirke will use this graphite oil, he will find a far better result, and can be sure that it does not want a "stir" before being in good working order.

E. SMITH.

"RECOMMENDED" HOTELS.

[19670.]-I lately stayed for a night at an hotel which sported the R.A.C. and A.A. signs, and appears in Michelin's guide, and never have I had more cause of complaint on account of food, service, beds, and charges. I know of two hotels in a summer resort, each "recommended," one of which has been bankrupt for over a year and the other with a bill of sale on the furniture. They were well known, locally, for their bad food and high charges. I am at a loss to understand how either house got put on the list.

Experiences such as mine make one hesitate to place any reliance on the hotels one finds mentioned, and, in fact, I generally avoid them.

Why should we not form a touring committee from members of the R.A.C., A.A., and Michelin, and have one common sign? If it were found necessary to withdraw the sign we should be protected, and the landlord would think twice about incurring the risk, whereas now, without joint action, one or other sign may, and probably would, remain. It would be better to let a tourist choose his hotel than to send him to a bad one.

The hotels in the smaller country towns are the most unsatisfactory, because, as a rule, they are in the hands of men who have failed at every other business, have had

no training, and are ignorant of the standard of comfort expected in return for their charges. AB 288.

MOTOR CAR SPEED ON MARGATE FRONT.

[19671.]-A notice has just been printed and posted in Margate by the Chief Constable to the effect that if the speed of motor cars be not reduced on the front, steps will be taken to stop fast driving. The usual trap is so unfair, and often catches the wrong persons, that I hope my fellow motorists will take special care themselves and mention the matter to their drivers. Much of the trouble lies in part at the door of the taxi-drivers of the town as well as visitors. The Chief Constable is most reasonable at present, and does not wish to take action.

PREVENTION.

A WARNING.

[19672.]-I must thank the Member of the R.A.C. [letter 19653] for correcting me in my statement that there are no motorists on the Eastbourne Bench. There is a system of classifying all who ride in or own motors as motorists instead of strictly limiting the term to those who drive themselves. It seems too obvious to point out that it is only those who drive themselves that can fully appreciate what is a dangerous speed and be in a position to pronounce judgment on it. It was probably some such idea as this which prompted a certain gentleman to inform me that there were no motorists on the bench, and no doubt he was quite unaware that so many as seven members of the bench themselves drove cars. Therefore I feel it only right that I should unreservedly apologise for repeating his misstatement.

The rest of the R.A.C.'s Member's letter seems to support my contention that the police are particularly active in Eastbourne at the present time. This he tries to justify by the fact that the streets in Eastbourne run at right angles to one another. I have tried very hard to think of any town in England where the streets do not run at right angles to one another. His letter also seems to imply that especial attention is paid by the police to strangers. Intending visitors should note this, and I can only hope that both our letters may justify their title and prove themselves a warning.

W. BASIL JONES.

FRENCH ROADS.

[19673.]-I have just returned from a 2,000 miles tour in France. I can fully corroborate the remarks of "Rochet" as to the state of the French roads. In many places the pot-holes were deep enough to bury a dog in; indeed, the "trepidation" was so bad that I lost one head lamp, the speedometer belt, and very nearly my generator, as it became completely detached. The worst stretch that I encountered was just west of Beziers; the condition is indescribable. My advice to those contemplating touring in France is, don't, unless it is on a very strong car.

A. H. MONT CHAUVÉ.

PETROL CONSUMPTION.

[19674.]-By a printer's error in letter 19644—or was it my bad writing—my Ford mileage shows 36½ m.p.g.; this should read 30½ m.p.g. over the 1,000 miles tour.

HENRY MOORE.

[19675.]-I have been driving a Ford for about five months, and can only get 23 m.p.g. The car gets very hot—sometimes boils. I always drive about 20 m.p.h. and I should be pleased if you could advise me what to do to stop the car from getting so hot. I have cut the mixture down as lean as possible. The car is a two-seater.

A DRIVER.

TRADE SIGNS.

[19676.]-Round Brechin, near which I live, there are many signs *re* tyres and petrol—Messrs. Michelin, Continental, Dunlop, and Shell spirit. I write to express the hope that these firms may see their way to remove their signs, for they do not add to the charm of the country. There are two important garages in Brechin, which I think one cannot fail to see when passing through.

DAILANUISGE.

THE R.A.C.

[19677.]-The R.A.C. has surely lost its balance, its perception, and its ability to judge situations. Cannot the Club see that it is required in its own interests to explain why, for the second time, it did not do the thing it promised to do? Cannot the Club understand that this second failure is of far greater importance than the first failure?

As a result of the first, it landed itself into an impossible and an undignified position.

But on this second occasion it has a far more difficult matter to deal with. This seems to be a question of personal honour.

Did the Chairman of the R.A.C. and the Secretary of the R.A.C. ask for help of the Victor Tyre Company? Did they receive that help? Did they give an undertaking or make a promise or suggest an equitable *quid pro quo*? What was it? Have they redeemed it or have they broken with their undertaking?

Mr. Yarworth Jones's statement and evidence is before us. Let us have the statement and evidence of the R.A.C. I am tired of the amazing vacillations of the R.A.C. It is quite pitiable, and quite unnecessary. If the R.A.C. is honest and honourable, for Heaven's sake let us see the evidence of it.

It is, however, certain that the Club cannot injure the Victor Company so long as Victor tyres remain as good as those I am using.

J. L. TEMPLER (Col.).

[19678].—I should like to join my protest to the many that I am sure you must be receiving against the latest action of the R.A.C. The Club that considers itself the principal motoring organisation should explain its position frankly to the motoring public.

SP 903.

VALVE STEMS AND TAPPETS.

[19679].—We are always told that an appreciable space should be left between the valve stem and its tappet to allow for expansion of the metal when hot. But the heat which lengthens the valve stem must also lengthen the cylinder, and so counteract the lengthening of the stem. No doubt the coefficient of expansion of the cast iron cylinder is somewhat less than that of the mild steel stems, but, on the other hand, the cylinder is longer than the valve stem, while the tappet stem does not get very hot.

I think it will be found that there is no need to leave a space between stem and tappet when cold. In an air-cooled engine, I have tried adjusting them in light contact. I have not yet tried it in my car as its tappets are not adjustable, and I must wait until valve grinding results in contact.

R. BLOOD.

MOTOR SCHOOL TRAINING.

[19680].—Having read several letters in *The Autocar* recently with regard to motor schools, I should deem it a favour if you would allow me to state my case.

I was engaged by a firm as instructor at a wage of 30s. per week, with promise of much more after one month's service if I could adopt their methods. I accepted their terms, but soon found it was impossible to deal with the students in the manner they expected. After being in their service one month, I asked for more money, but was refused, the manager remarking that he had heard I had written to a newspaper with regard to the school. I then gave one week's notice, but was dismissed at once; the manager would not allow me to work out the notice or pay me. The following week I called at the works after business hours, along with a friend, and I was arrested and taken to the police station for being on enclosed premises. This was a trap set for me, and when the case was heard at the police court we were both dismissed. I put the firm in the County Court for my wages. The case was tried on June 5th, and decided in my favour.

F. A. INGHAM.

[19681].—I have read with great interest "Owen John's" comments and criticisms of the coachman chauffeur and the driver mechanic in your issue of June 7th, and quite agree with him as to the worthlessness of motor school experience. Four years ago, having had several years' workshop experience with different motor firms in a section of the trade which I was told was detrimental to my health, I bethought me of a motor driver's job, and forthwith I forsook my trade and clinched matters with a well known motor school in London for a certain fee. In about four weeks I was proclaimed an efficient chauffeur and given a certificate, although I had only had four actual lessons in driving of about half an hour's duration each. I was then offered assistance towards getting a situation, and in the course of a week or so received two letters from the school. One I answered personally, but did not get, as I had had no colonial touring experience. The other being in the North of England I answered by post, but received no reply. For eight months I advertised, answered advertisements personally and by letter, but on all sides the same reply, "Not

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sufficient experience," till at last, disgusted, I went back to my own trade, having literally wasted about £20 of hard earned savings. I think it is shameful that the schools should be allowed to go on grabbing the money of over-ambitious men who have no influential recommendation to rely upon, when a glance at your advertisement columns any week will show that the number of drivers disengaged is far in excess of the number of drivers wanted. In conclusion, I would like to ask "Owen John" if he is aware that there are certain gentlemen, who, having disposed of their horses and carriages for the more modern mode of travel, have placed their coachmen in schools, paid their expenses, and then dismissed them, taking on a chauffeur with past experiences.

VAL. C.

[19682].—At the beginning of this year I was anxious to get a knowledge of how to run and look after a car before purchase. My difficulty was the same as that of many others, as to where I should go and which school to choose out of the many that advertise. Quite by accident I went to the motor schools in Heddon Street, London, and went through the most satisfactory course of lectures and driving instruction.

I have attended various courses during my term in the Service, but the lectures given at this school, with full-size models for illustration, were the best I have ever attended, and I can conceive of nothing better.

All instruction given to both car owners, as myself, and would-be chauffeurs, etc., was on really sound lines, thoroughly discouraging the cheap "garage tips" as to driving, etc., which are generally pure swank and usually bad for the car. I intend to send the boy I have to clean and look after my car through a course at Heddon Street when next in London, as I am certain that he will only learn there what is best both for myself as his employer and for himself as a chauffeur.

My sole reason for writing this is that perhaps it may be noticed and be of use to others in the same predicament as I was myself, anxious to learn about a car but doubtful where to go and be certain of receiving really good instruction.

C. MONTAGUE JOHNSTONE.

ROAD SURFACE VARIATIONS.

[19683].—The condition of the Bath Road between Hounslow and Colnbrook is disgraceful. The whole surface is pot-holed; the wheels jump from one hole to another, causing the greatest physical discomfort, not to mention damage to the car and to the temper of those unfortunates who have to use this road.

The next stretch, from Colnbrook to Slough, is relatively excellent, yet the traffic conditions are identically the same—week-end motor buses and commercial heavy motors use both sections alike. Why this difference? Is it merely a question of road surveyor, or is it a question of policy on the part of different local authorities?

This astonishing difference in road surface is found on other roads where the traffic conditions are the same, and *The Autocar* would confer a great boon on the heavily taxed motorist by finding the cause and the remedy.

S. RICHARDS.

THE KIND OF MOTOR CAR THE CANADIAN LIKES.

[19684].—I have been resident in this part of the globe for close upon three years, and, being in the trade, I thought you might like to have some information on motoring matters out West.

There are well over 5,000 registered motor vehicles in British Columbia alone, and most of those are owned in Vancouver and Victoria, the two principal towns of British Columbia. Nearly all cars seen here are of American manufacture, including Packards, Wintons, Studebakers, Overlands, etc. There are a number of Napiers and Russells and Tudhopes (the two latter being Canadian cars). In Vancouver by far the greatest number of cars are Cadillacs and Fords.

The Canadian fully realises the great convenience of the modern motor car, and he is not the least backward in investing his money in an automobile if he can at all afford it. It is hard to realise the number of cars that have been, and are being, sold in Western Canada, and so far only the surface of the business that there is every indication is going to be done in the near future has been touched.

It is greatly to be regretted that this large volume of business should pass into the hands of a foreign country when there would appear to be no real necessity for it. The true Canadian is very loyal and has great faith in English manufactured articles; other things being equal, he would choose the English car every time. But it is a fact that,

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with few exceptions, the English car is not entirely suited to the conditions met with in Canada. Exactly wherein the car from the other side of the "pond" lacks in design for Canadian use is a matter that would take too long to go into thoroughly. However, the outstanding "differences" in the design of the American or Canadian car and the British car—points no doubt well understood by most manufacturers—are somewhat as follows: For use in Canada, more especially Western Canada, cars must have ample power, owing to the bad roads in so many places. The car should not be high geared. Wheels should be strongly built, of ample size to give plenty of clearance, and preferably of the artillery pattern. It is not uncommon to hear of the wire spokes of the wire wheel being nipped through coming in contact with sharp obstacles at the side of a rut while the car travelled over a particularly bad piece of road. The steering gear should be strong and a fine pitched worm employed. The springing arrangements must be well carried out, long, flexible, and strong springs being used—preferably full elliptics at the rear. Shock absorbers must be fitted and rubber bumpers. Brakes should be large and powerful. Both brakes acting on a single drum on the rear wheel is almost the universal type here, and this arrangement works very well; it leaves both brakes at the control of the driver at all times, and does not subject the transmission to extra and unnecessary strain such as happens with the transmission type of foot brake.

Cars for use in Canada must have self-starters. Excepting one or two makes of very cheap cars, people here will not look at a car unless it has this very desirable fitment. The electric starter is the most popular, and there are dozens of different makes already on the market in the States. The working of the typical starter of the electric type is simply a dynamo driven off the engine; the current generated is stored in a large battery, from where, in turn, it is drawn to operate the starter (generally a series-wound electric motor of about 3/4 h.p., geared to the flywheel with suitable cut-out switch, over-running clutch, etc.) and supply current for the lights, electric horn, and cigar lighter if desired. This outfit is found on some of the most inexpensive cars this year, and appears to be giving every satisfaction in most cases. Other types of starters are the compressed air, either of the kind that admits air under pressure direct to the cylinders through a suitable distributing valve, or the type wherein the air is used to drive a small air motor, which in turn is geared to some part of the crankshaft or flywheel. These starters are popular with a number of people.

Vancouver, B.C.

LEWIS W. MURRAY.

THE CHAUFFEUR-GROOM

[19685.]—As a mechanic-driver I should like to add a few words in answer to your correspondent 19540.

Coachmen-chauffeurs and other cheap men are all right in their way, and no doubt answer the purpose of those who employ them, viz., cheapness mostly. Thank goodness, there are plenty of people who will only employ the fully qualified man. I had the pleasure of driving for a number of years a gentleman who would have none other than a mechanic, and who was chief engineer to a large works in the Midlands. During the time I was with him several instances occurred which made me heartily sick of the unqualified men.

He always impressed upon me the necessity of stopping to help in cases of *en panne*. In one instance a car was held up with a puncture, apparently, and we were signalled to stop. My employer got out, and called to me, "Here is a job for you." Inspection showed that the thread on the hub shell was burred up, likewise the threads on both wheels through endeavouring to force them on. A couple of small chisels and a Swiss file did the job in ten minutes. The chauffeur had never seen any chisels like mine, and asked where I bought them. "Made them myself," I told him.

On another occasion a chauffeur had had tyre trouble, and had been trying for over half an hour to start his engine. My employer said to me, "Ignition?" "I do not think so," I replied, "More likely, mixture." I opened the compression taps after testing the ignition, gave three or four swings, and the engine fired.

Another case of mixture occurred outside an hotel. The chauffeur was perspiring profusely. The trouble was a punctured float. No spare, of course. My blow-lamp soon set the matter right.

People boast of having had their cars so long and never had the slightest trouble, etc. "Our coachman does all that is necessary." But there comes a time when a man who has had his shop experience and can use his tools and has them with him, can often save his employer much more than the

extra wages. The sarcastic remarks regarding appearance may have held good some years ago, but not now on the smart cars to be seen in town. Watch the chauffeurs packing cars away in a large public garage, and of the mugs a large percentage will be found to be ex-coachmen.

A word to the wise. Do not be so quick to help the man in trouble. It does not pay. The remarks of Mr. Gerald Biss in "Motor Dicta," "The Reformation of the Chauffeur," page 121, still hold good. A. J. HAWKINS.

RUNNING ON BENZOLE.

[19686.]—I was much interested in Mr. C. H. Stephenson's experiences with benzole in his Rolls-Royce car [letter 19643]. I own a car of similar make, but an older type. It is one of the 700 series. I used benzole some years ago in this car, and I have never had any trouble from the benzole attacking the metal of the carburetter. I am using benzole again now, and have been for some months, and the other day I examined my carburetter and found no trace of any deposit. The float was black—it has been for a long time—but I could not rub anything off it with my finger. I have been disappointed in the mileage obtained—about 15.5, taking short journeys and long ones—but on a hundred mile run I got just under twenty miles per gallon.

The exhaust is foul, especially at first when the engine is cold, but when it gets hot, I have not found the exhaust much worse than when using heavy petrol such as Taxibus. The hotter the engine gets, short of boiling, the better, and possibly the makers might supply a slightly shorter fan blade for use with benzole.

Starting from cold is harder, especially in the winter. I always put some petrol into the induction pipe when I get home, and I find the engine will generally start up fairly easily next morning, unless the weather is very cold.

The worst of benzole is that it freezes at about 9° below the freezing point of water. I had trouble that way once. By using a mixture of 40% petrol and 60% benzole, which lowered the freezing point very considerably, I had no further trouble.

Could the deposit in Mr. Stephenson's car be due to dirt or something dissolved out of the petrol tank and deposited by evaporation of the benzole in the carburetter? Benzole is a much more powerful solvent than petrol, and it is possible something of this sort may have happened.

ARTHUR L. ONSLOW.

Will Mr. F. Smith, who wrote us about the "Strange Cars," kindly send us his address so that we can communicate with him?

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Flashes.

A start has been made with the signposting of the main trunk road in Scotland. The part from Carlisle to Lanark has been completed, the part to Pitlochry is well in hand, and the portion from Erskine Ferry to Inveraray to Oban will next be dealt with.

* * *

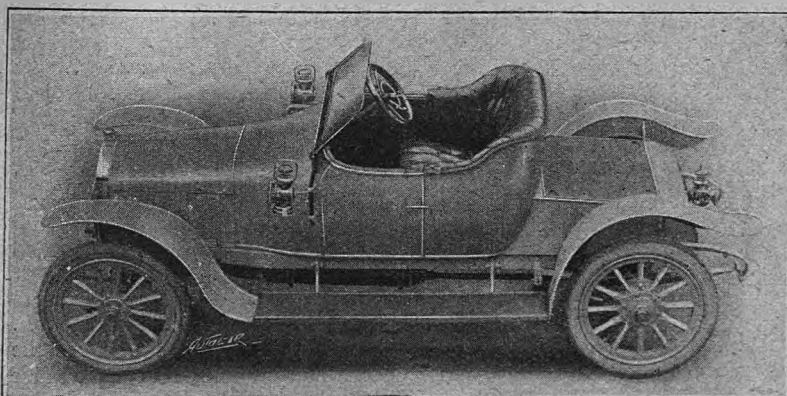
The first Roads Improvement Association Conference will be held at the Royal Automobile Club, Pall Mall, London, S.W., to-day (Saturday), June 21st, at 3 p.m., when two papers will be submitted for consideration and discussion: (1) "The Trend of Modern Road Construction," by Col. R. E. Crompton and H. Percy Boulnois (vice-chairmen). (2) "The Organisation and Work of the Branches of the R.I.A.," by E. S. Shrapnell-Smith (hon. treasurer) and Wallace E. Riche (general secretary). At 7.30 in the evening a dinner, by invitation of the Council, will be held in the Great Gallery of the Club.

* * *

Considerable activity is being displayed against motorists by the police in the Southam Division of Warwickshire. At one sitting of the magistrates recently nine cases were brought up, and fines varying from £2 to £3 5s. and costs were inflicted for the purely technical offence of exceeding the speed limit, without any suggestion of danger to anyone, over a measured quarter of a mile between Woolscott Windmill and the Tollgate.

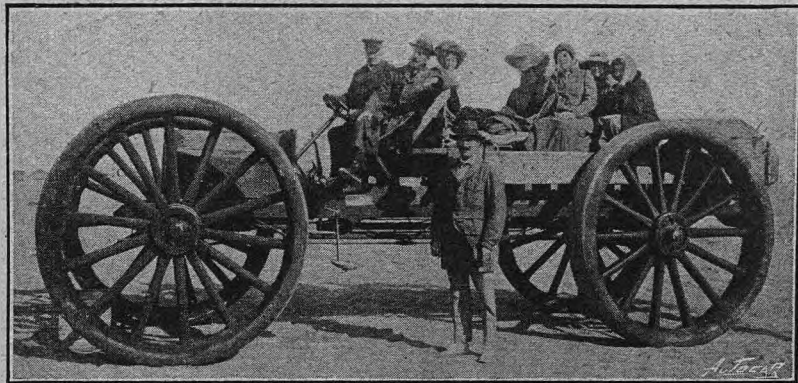
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At the Long Stratton (Norfolk) Petty Sessions on June 10th a labourer named William Dye was sentenced to one month's imprisonment with hard labour and was ordered to pay £2 damages and 14s. 6d. costs for deliberately stepping backwards into the roadway in front of two approaching motor cyclists, and causing one of the bicycles to be overturned, with consequent injury to both driver and cycle. The Chairman of the Bench remarked that the conduct of the defendant was one of the most maliciously wicked acts that had come before him during the long period he had been a magistrate.



A 10 h.p. (76 x 89 mm., four-cylinders), Austin chassis with a standard "Courier" type open body. It will be noticed that the appearance of the car has been greatly improved by the neat taper bonnet and concave dashboard.

At Tewkesbury Police Court on the 6th inst., William Green, a Tewkesbury drover, was fined 2s. 6d. and 7s. 6d. costs for wilfully obstructing the free passage of a motor car at Deerhurst on June 7th. The prosecutor, Mr. Clarence Hughes-Hallett, of Broadway, Deputy Inspector-General of Indian Police, said that when driving from Gloucester to Tewkesbury he met a drove of cattle in charge of defendant, and although he sounded his horn for some distance, and on reaching the cattle pulled up and requested the defendant



A CAR OF THE DESERT. This automobile is the invention of an English officer of the Egyptian army, and has made many successful trips. The chassis is placed on wooden wheels of large diameter covered with special tanned buffalo skin. A step further would be the distillation of alcohol from dates for use as a motor spirit in the desert.

to clear the road, defendant made no attempt to do so, but laughed at him. By dint of "hooting" and careful manoeuvring the motorist eventually got through. Not to be too hard on the drover, and presumably to show that the proceedings were taken merely as a warning to others, the motorist himself paid the fine and costs. Although very laudable, we question the wisdom of such generosity towards anyone convicted of causing an obstruction of this kind.

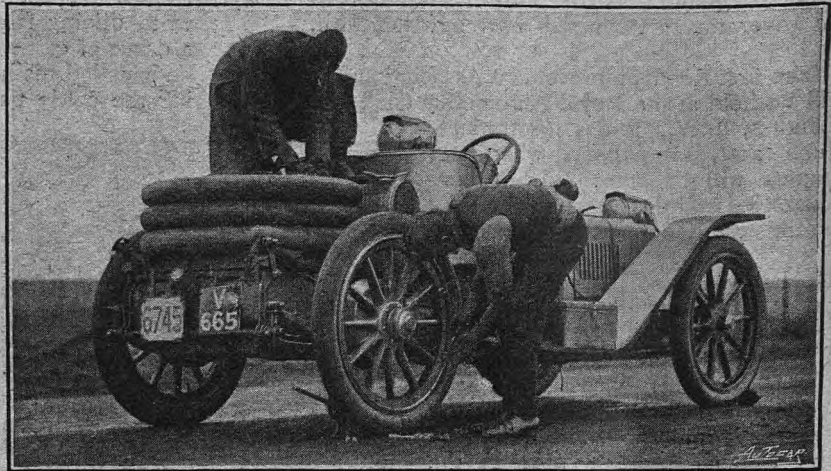
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A point of some importance to motorists was raised in a case heard at Selly Oak on Friday last week. Percy Hefford, 387, Pershore Road, Selly Park, was summoned for failing to produce his driving licence upon demand, and the evidence showed that the police officer, who had seen defendant riding earlier in the day, called at his house and asked to see the licence. No question of infraction of the law while he had been seen riding was raised, and defendant refused to show his licence on the ground that he was not using his machine at the time. In cross-examination, the police officer admitted that he had seen defendant's licence some months previously. The defendant's solicitor pointed out that the charge was for failing to produce the licence in Dogpool Lane, when as a matter of fact he was not asked for it in that place at all. He further urged that the summons was bad in law, and asked that it should be dismissed. The police would soon be fetching a man out of his bed or out of church to produce his motor licence. The magistrates ordered defendant to pay the costs, 6s.

Flashes

The Sydney to Melbourne motor car record has been broken recently. The previous record was made by Mr. G. C. White, of Adelaide, S.A., who accomplished the run of 570 miles in 19h. 47m. Several attempts have been made by local motorists to lower this, but hitherto without success, until Mr. A. V. Turner, a well-known member of the Automobile Club of Australia, made the trip in 19h. 2m., thus lowering Mr. White's record by 45m. Mr. Turner achieved this feat under the most adverse conditions. It was very late in the season for such an enterprise, there had been heavy rains in the interior, and the roads in many places were almost impassable quagmires. However, power and pluck pulled him through. He drove a 50 h.p. America underslung car, and, starting from Melbourne at 2.30 a.m., reached Albury, on the N.S.W. border, at 9.10 a.m., only ten minutes behind his schedule time. Despite the condition of the roads in N.S.W., he arrived at the Sydney G.P.O. at half-past nine in the evening. Mr. Turner is certain that had it not been for tyre troubles he would have made the distance in seventeen hours. An illustration of the car on which the record run was made appears on this page. Mr. Turner's business partner, Mr. Stanton, has announced that he is about to make an attempt to lower his colleague's record, using a 100 h.p. Benz, and if power can settle the matter he should certainly succeed.

At the inter-club meeting arranged by the Dorset Automobile Club on Weymouth Sands, Mr. A. W. Tate made fastest time on his Grand Prix 1908 type Mercedes in the open handicap.



Sydney to Melbourne, 570 miles, in 19 hours 2 mins. Mr. A. V. Turner recently broke the previous record of 19 hours 47 mins. on a 50 h.p. America. The illustration shows one of the delays through tyre troubles.

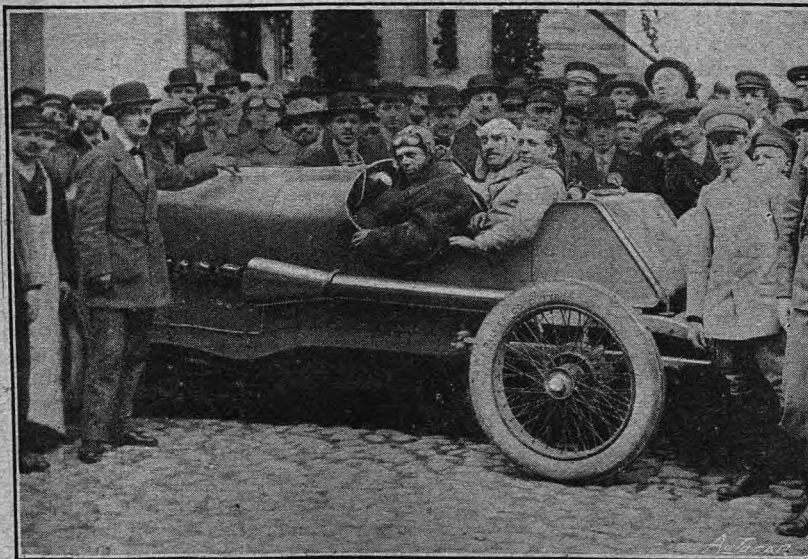
As a result of his recent visit to the Automobile Exhibition in St. Petersburg, the Czar of Russia is reported to have placed an order for a Brasier six-cylinder chassis. The first car ever possessed by His Majesty was a Brasier.

* * *

In the description of the 20-25 h.p. Studebaker car which appeared in our issue of May 31st we stated that this car was fitted with the Splitdorf magneto as standard. This was the case when the particulars for the description were taken, but since then an alteration has been made in this respect, and Studebaker cars are now all fitted with Bosch dual ignition.

* * *

The twelfth annual meeting for the Mont-Ventoux hill-climb is fixed for the 9th and 10th of August next. Cars can be entered in the second and third series, the second series for racing cars, the third for touring cars, but these series are divided into eleven and twelve classes respectively. The first class in the racing cars includes cars having a cylinder capacity up to 1 lit. 200 and the eleventh class cars with a cylinder capacity of 5 lit. 300 to 6 lit. 500 inclusive. The first class of the touring cars includes cars of a cylinder capacity up to 1 lit. 200 inclusive, while the twelfth includes cars above 6 lit. 500. Entries close to the Automobile Club of Vauclusion, 9, Place Crillon, Avignon, on the evening of Wednesday, the 6th August next. Entry forms can be obtained from the secretary at the above address. Entry fees for cars 100 frs. (£4.)



THE BRUSSELS TO ST. PETERSBURG RUN. The fastest time was made by M. Christiaens on a 30 h.p. six-cylinder Excelsior car, fitted with Palmer cord tyres. Leaving Brussels at 5 p.m. on Wednesday, May 21st, he arrived at St. Petersburg at 7 a.m. on Saturday, the total time being sixty-two hours. After allowing for stops, the net running time was thirty-seven hours, which gives an average of rather over fifty miles an hour. Although the roads were in many places in a deplorable condition, long stretches having only recently been re-laid in unrolled metal, M. Christiaens experienced no tyre troubles. A rather peculiar arrangement with regard to the exhaust pipes on this car can be noticed. The open exhaust pipes from the cylinders are swept round to face towards the rear of the car, and in a line with the blasts from them is a very large bore pipe having at its forward end a kind of collecting funnel.

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. 2711.—Taunton to Exeter and Launceston.

I was down in Devon last week with a 17-25 h.p. Armstrong-Whitworth and went over the road between Exeter and Okehampton, and I can assure your correspondent he need have no fear of this road, the pot-holes are not in the least excessive. He will certainly find a good deal of loose flint about in various parts of the country, but, beyond this, all the roads I traversed are quite up to the average, and above average in many places.—REGINALD R. SMITH.

The Exeter-Okehampton Road is vile and unfit for any self-respecting car. "M.W.B." might try the road *via* Bampton, which is perhaps more hilly, but pretty, and was in good condition last September when I traversed it, having been recently repaired fairly sensibly.—A.M.

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

I experienced the same trouble and found it was caused by using a lubricating oil which was too heavy. The 1912 Krit requires a very small quantity of very thin oil. Wakefield's Castrol has been recommended to me, but I have not tried it.—H. FILLINGHAM WILLIAMS.

No. 2701.—Benzole on Bedford Car.

I have been running a 15-18 h.p. Bedford for the past six months, and have found no difficulty at all in adjusting the carburetter, but on the contrary like it very much indeed. With petrol I managed to get 25 and sometimes 26 m.p.g. on a straight average run. I have just taken to benzole, and have obtained surprising results. I have got on three consecutive days 36.8, 35, and 36.4 miles to the gallon. The first was tested by running out all petrol from the tank and carburetter and putting in a pint of benzole. The other two were from accurate gauge readings over runs of 21 and 38 miles with two or three stops. Incidentally, I think this speaks volumes for the carburetter, which I use without any extra air inlet.—BEAUCAIRE.

QUERIES.

No. 2716.—Studebaker Spare Parts.

WOULD any readers who have a Studebaker car let me know if there is any difficulty in getting prompt delivery of spare parts?—WALKES.

No. 2717.—20 h.p. 1913 New Pick Car.

WOULD any owner of one of the above cars tell me his maximum speed on level, petrol consumption, and if he is satisfied with the power the engine gives on hills? My car has a four-seater body, and with Zenith No. 30 carburetter I average 20-22 m.p.g. Speed, 33 m.p.h. I have tried numerous combinations of jets and choke tubes without improvement, and wonder if a size larger carburetter is needed. The engine does not pull well on a long steady rise, but on an un-

dulating road where speed can be maintained it pulls better. I have done 1,300 miles, and think the car is wonderful value for the low price it costs, but should like a little more power for the petrol used.—R.O.C.

No. 2718.—12-13 Riley and 22 Metz-Lion.

WILL any reader give experiences with 12-13 h.p. Riley and 22 h.p. Metz-Lion in hilly districts as regards climbing, cost of running, and wearing qualities?—JESSICA.

No. 2719.—Swinging of Light Car.

I SHOULD be glad if any of your readers could recommend some thoroughly good appliance to prevent the swinging and jumping of an E.M.F. car when travelling unladen over bad roads.—R.A.H.

No. 2720.—Foy-Steele Car.

I SHALL be glad if any of your readers with knowledge of the Foy-Steele car could give me their experience and tell me whether the car is light on petrol and tyres. I believe the springing of the car is very good, but I shall be glad to know if the method used has many wearing parts.—W.B.

No. 2721.—Hired Car in France or Belgium.

WHAT would it cost to hire a car with chauffeur (to carry six inclusive) for about a fortnight at some summer resort on the North coast of France, or in Belgium, within easy reach of places of interest, such as Amiens, Beauvais, etc.? Somewhere in the neighbourhood of Boulogne, Calais, or Ostend; seaside not essential.—VACATION.

No. 2722.—Carburetter for 16-20 h.p. Wolseley.

I SHOULD be obliged if any of your readers would let me know if they have fitted a 1912 model 16-20 h.p. Wolseley with a White and Poppe or Zenith carburetter, and, if so, if they have found any improvement over the S.U. fitted by the makers in the following respects: (1.) Hill-climbing. (2.) Easier starting when cold. (3.) Speed and acceleration. (4.) Petrol consumption.—H.H.P.

No. 2723.—Binks and Bailey-Dale Carburetters.

WILL any of your readers who have had a Binks De Luxe carburetter fitted to their engine kindly give me their opinion of it, particularly as to easy starting of engine, slow running, and flexibility? I find my engine difficult to start (magneto ignition only), and the exertion required leads to hand shaking, which is bad for my work, and I would be thankful for any reader's experience with the above or with the Bailey-Dale two-jet carburetter.—TIRER.

No. 2724.—20 h.p. Five-seater 1913 Ford.

YOUR correspondent F. C. James recommends a fitting which would be beneficial to this car, viz., an extra air inlet on inlet pipe and I should be extremely grateful to him or any other readers for the benefit of their experience as to the best make of



SOME QUERIES AND REPLIES.

Under this heading in "The Autocar," May 31st and June 7th, the following appeared in reference to the CYLCLEAN PROCESS OF DECARBONISING CYLINDERS, which furnishes definite proof of the efficacy of the process.



THE QUERY,

which appeared in "The Autocar," May 31.

Removing Carbon from Cylinders.

Would any reader give me his experience of removing carbon in cylinders by the aid of the Cylclean process?—W. R. CHILL.

THE REPLY,

which appeared in "The Autocar," June 7.

Removing Carbon from Cylinders.

I took delivery of my present car a year ago, and drove it some 7,500 miles within the twelve months. At the end of that period, though the engine was running as well and quietly as when new, with no suspicion of a knock, still, I rather fancied that the car was inclined to be a little sluggish on hills, and was not picking up as quickly as it used to do. I took the car to my local repairer, who holds a license from the Cylclean Co., and within an hour the operation, which was found to be badly needed, was duly completed. The results have far exceeded my expectations, as the car immediately recovered its usual sprits and former liveliness. Compared with the old and laborious method of taking down the engine for the sole purpose of scraping the cylinders, to say nothing of the loss of time the car is out of commission, and also of the expense incurred, I think the Cylclean process is greatly superior and quite as efficient, and it certainly will be more universally used when the private owner has become educated to the fact that the process has no deleterious effect on the engine.—G. A. GILDEA.



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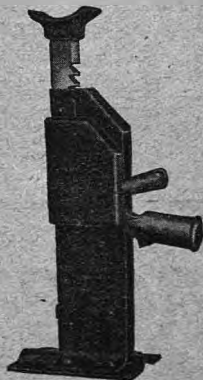
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Some Queries and Replies (Continued).

fitting for this particular car and also results obtained. My experience is that I can get 23½ m.p.g. in the country all round. The jet can be set from dashboard quite fine when running at 15 to 25 m.p.h., but should you pull up in traffic and close the throttle, then the engine stops. Added to this, the engine seems to get unnecessarily hot without actually boiling the water. —H. F. KEMBALL.

QUERIES AND REPLIES.

No. 2725.—Braking and Descending Hills.

BEING an amateur driver, I am anxious to have your opinion upon the following points: (1.) Is it good or bad practice to apply brakes only and not withdraw clutch in slowing down? Generally speaking, I find a car much more easily controlled if this be done (especially on a greasy road), and take it that, provided the engine is throttled down and the clutch withdrawn before it comes to the point where the car is going slower than the engine would take it at that position of the throttle, no harm is done. (2.) In descending, say, short steep hills, if the clutch be withdrawn the car gets a tremendous impetus, and is much harder to pull up than when the brake is applied only, and the engine used as brake as well. (3.) In descending long hills, what is the correct thing to do, go down with the engine throttled on lower speed, apply brakes only, or what? (4.) Is there any harm in checking the speed of a car with the clutch only on a greasy road when plain tyres are fitted, as you know it is impossible to use brakes sometimes on a bad surface?—F.B.

(1.) In the ordinary way when slowing down it is best not to withdraw the clutch when applying the brakes till the car is running slower than the engine would run when throttled down to about the right speed to keep it running without stopping. (2.) In descending short steep hills it is a mistake to take the clutch out. It is far better to keep it in and to have the throttle closed, or nearly closed, using the engine as a brake as well and the brakes as required; in fact, you may take it broadly that you should always use the engine as a brake and only supplement its retarding effect by the brakes when such effect is insufficient. (3.) In descending long and really steep hills which are at all dangerous, the best way is to stop just before the top. If the hill be excessively steep and very twisty or greasy, put in the first speed and drive gently over the crest, then nearly close the throttle, and go down on the first speed, with the clutch in of course, and using the brakes as required. If the hill be not so bad, you may go down on the second speed, if you have four speeds. Again, there are hills which come between the two as it were, i.e., really too steep to go down on the fourth direct and not steep enough for the second. For those you can use the third; but as it is not easy to change down when going at any speed without damaging the gear, it is far better to stop at the top in all cases, then put in the first, and either keep it in or change up to the second or third as the hill warrants. When a hill looks dangerous and you do not

know it, put in the first and keep it in, as it is better to err on the safe side. (4.) You should never use the clutch as a brake; that is to say, if the road surface be so greasy that you cannot use the brakes you ought not to have the clutch out except just at the moment of coming to a dead stop. The only time, except when gear changing, that it is necessary, or rather desirable, to take the clutch out, is when turning sharp corners, as it eases the tyres.

No. 2726.—Damage from Tarred Roads.

IS there no remedy against the county councils laying tar on the highways right across the roads so that cars are ruined and often damaged, to the extent of fully £10 or £15 in three minutes in the case of newly painted fine cars? Has any test case been taken; if not, do you think it could be successful? If a drain or gutter is left improperly filled up on the road a local council is liable, then why not for spoiling your car?—F.A.B.S.

As to whether county councils are liable for damage sustained through tar being laid right across the road, depends upon the facts in each particular instance. A case came before the Court of Appeal in the year 1909 (*Torrance v. Ilford Urban District Council*), which, though not concerned with tar, dealt with the repair of the whole width of the road. The plaintiff endeavoured to recover damages for the loss of a horse which had been killed under the following circumstances. The horse was one of two drawing a waggon containing three tons of manure. In a lane through which the waggon went the council were repairing the road, and for about 130 feet granite stones had been laid over the whole roadway. On part of this the stones had been rolled in by a steam roller, part had been partially rolled in, and the remainder had not been rolled at all. The driver put his horses to the task of getting over the stones, but one of the horses eventually fell down and died from a ruptured vessel. It was impossible for the waggon to turn round in the lane, and there was no warning notice as to the repairs at the commencement of the lane. The jury found that there was negligence on the part of the council, and that the driver could not by taking reasonable care have avoided the consequence of such negligence, and also that the death of the horse was the natural consequence of the negligence. The council appealed to the Court of Appeal. The appeal was dismissed, but not unanimously. We think the reason it was not unanimous was with regard to the last finding, that the death of the horse was the natural consequence of the defendants' negligence. We think before the owner of a motor car could recover damage done to his car through a road being tarred the whole width, he would have to show that the road had not been temporarily closed for traffic, that there was no warning notice put up, and that it would be impossible for him to have pulled up his motor car in time to prevent it going on to the tar. If a motorist could see the condition of the road, and then took the risk, he would not be able to recover damages, but if he came on the tar suddenly without warning, as on going round a bend, the case would be different.

Week-end and Touring Notes.

North Derbyshire and the High Peak.

By A. J. S. Graham.

No other district is so rich as "The Peak" in the curious works of nature. The Seven Wonders of Derbyshire have long been proverbial, and one alone is human handiwork.

The moors of Derbyshire are unrivalled; surrounded, as one may be, on every hand by vast expanses of moorland, there is no feeling of monotony.

As for the dales of Derbyshire, they are peerless. From the perfection of luxuriant sylvan scenery as represented in its most faultless form by that queen of all the dales, Dove-dale, to the wider, wilder, bleaker straths such as Middleton Dale, all are there.

The climate of Derbyshire varies, too, as much as the land: bleak and biting are the winds on the hills, but bracing and vitalising to the sturdy; mild and warm are the sheltered dales, soothing and gentle to the weak and invalid.

Derbyshire is eminently the county for the motorist, as otherwise travel is rather difficult, but to see it thoroughly he must be more than a motorist. Some of the dales must be seen on foot, and some peaks should be climbed. The roads, though dusty when dry and slimy when wet, are nevertheless good. Made of the district limestone, they furnish, in wet weather, the mixture known as "Derbyshire cream." The hills of the county are more trying than dangerous, longer than steep, though the stranger should always be careful and prepared for the unexpected. In many cases the descents to the towns are winding and steep. More than once I have found, on rounding a corner, the roads blocked by rural carters, and only the fact that I was prepared for any such emergency saved the situation.

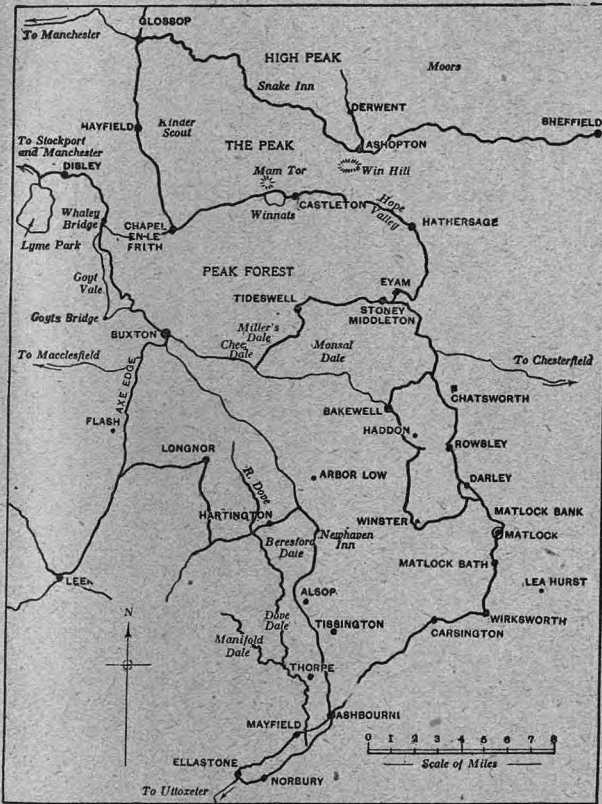
The tour about to be described includes all that is best in the Peak District and most of picturesque Derbyshire, and I hope that no motorist will be alarmed at it commencing from the city of Manchester.

Leaving behind us the Mancunium of the Romans, and the muddiest mud in all the United Kingdom, we come to the town of Stockport, on the Cheshire border, some six miles away. The river Mersey, rolling mournfully along, and black here, marks the division between the counties. There is little to see at this town except modern

industrialism, but its weekly market on Saturday is a bustling, cheerful affair, full of life and animation.

At Disley, Lyme Park, the seat of the Leghs of Lyme, is passed. It contains some magnificent trees, and the hall is a fine classic building, beautifully situated amidst imposing surroundings.

At the highest point of the park is a peculiar building known as Lyme Cage. It was erected as a hunting



tower, to enable the ladies to enjoy the pleasures of the chase, without the fatigue.

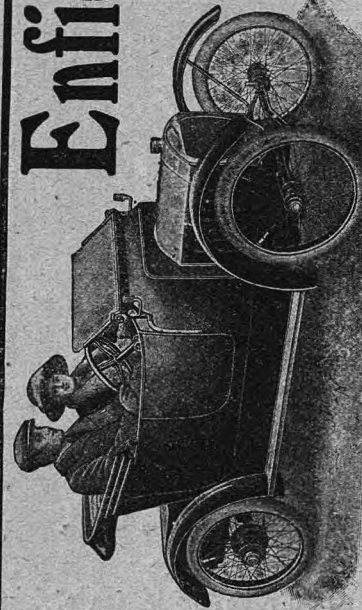
At Whaley Bridge the border of Derbyshire is crossed, and here commences a long five-mile climb along the road to Buxton. To the west, however, is Goyt Valley, which provides a beautiful three-mile walk along the banks of a winding stream, past woods and moors, and luxuriant plant life in every form, finally ending at the famous beauty spot known as Goyts Bridge, a picturesque scene that will satisfy the most exacting. Here rejoining the waiting car and regaining the main highway, grand views of sweeping moorland, hill, and valley are enjoyed. Fourteen hundred feet above sea level marks the summit of the road, and two miles away, and four hundred feet below, lies the town of Buxton, nestling between and sheltered on every side by rising hills, showing blue in clear splendence through the translucent air.

Buxton is the highest inland town in England. Its fame as a watering place is known far and wide.

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Week-end and Touring Notes (Continued).

times a week to the capital. The fare from London through to Manchester was two guineas inside and one guinea out.

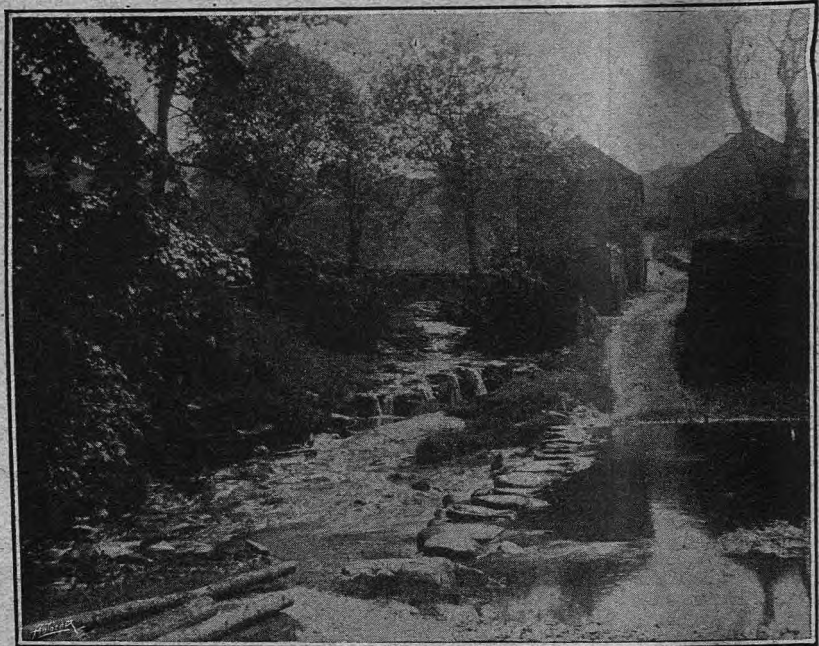
In Poole's Hole or Cavern, Buxton possesses one of the Seven Wonders of Derbyshire. This huge cavern is said to derive its name from an outlaw named Poole, who secreted himself in its gloomy recesses. But the cave also appears to have been used by prehistoric man for a dwelling place, articles having been found indicating such occupation.

Buxton has winter attractions as well as summer, for when snow covers the ground sleighing and tobogganning are carried on with great energy. A long rise leads from the lofty town to Axe Edge, one of the chief watersheds of Central England. The views from here are wild and impressive, noble moorlands extending far away into the distance. No dominating outlines soar upwards breaking the skyline, for here, 1,800ft. above the sea, one is above

men, the bad coins they distributed received the name of "flash money."

Continuing onwards along the lofty moorland, away on the right are some lofty masses of fantastic rocks, known as the Roaches. The country hereabouts presents a scene of primeval grandeur. As it is now, so has it been since the dawn of history. Hill and valley remain unchanged since skin-clad man pursued his lonely way, shunning the all surrounding desolation in dread of the wrath of unknown deities.

Returning and travelling eastwards, a few miles along a steeply undulating road leads to the county market town of Longnor, which is situated amidst picturesque surroundings. Turning for Hartington the River Dove is crossed, and here commences the well-known Beresford Dale. This portion of the river valley forms the theme of the second part which Charles Cotton added to Walton's "Compleat Angler." The dale is short, but delightful. It con-



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- 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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the world. Far away to the north are the sullen and misty masses of Mam Tor and Kinder Scout, dimly visible through the grey haze of the moorlands. The air is like the elixir of life.

The hill village of Flash lies at the confines of three counties, Staffordshire, Cheshire, and Derbyshire, so that, in the good old days, it was greatly favoured by prize-fighters, who, by moving their ring a few yards one way or another, could defy the interruptions of the police, unless all the counties were represented. The Travellers' Rest Inn is the third highest in England, being 1,535ft. above the sea level.

It is, by the way, from this little village that spurious coins received the name of "flash money." In the past the place was a favourite resort of hawkers, who used to collect and spend the winter months here. They passed the time in making false money, which they disposed of during their summer's hawking, and, being known as Flash

tains the world-famed Fishing House which Cotton erected for himself and his fellow crony.

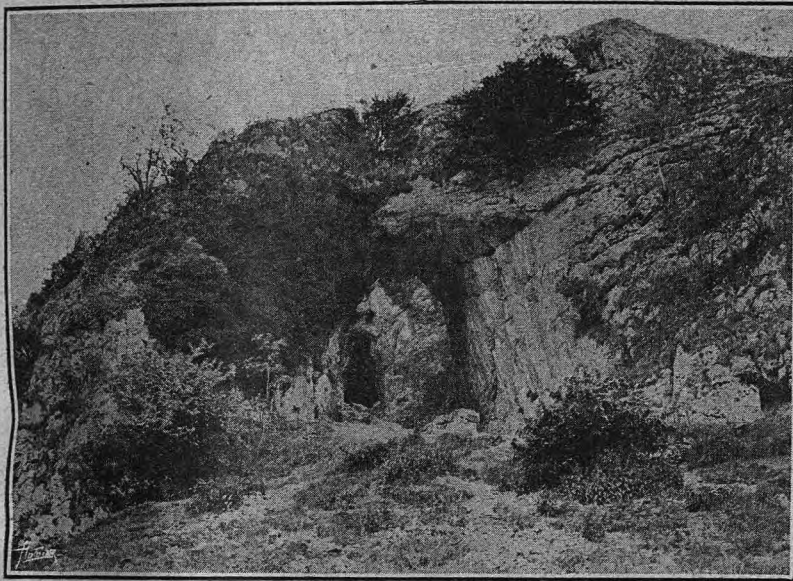
Here in the little Dove he and Izaak threw their lines and caught their fish. In the little fishing house they cooked and ate them, and then over their pipes discussed their joys and sorrows.

Hartington is a pleasant breezy little town. At the Charles Cotton Hotel is an interesting collection of old prints of Cotton and Walton. Up hill from this village the high road is bounded by craggy walls of jutting limestone which reverberate the echoes of passing cars. After joining the old Roman high road a little to the north lies Arbor Low, the Druidical Temple of North Derbyshire, sometimes termed the "Stonehenge of the Midlands." It forms the chief example of prehistoric remains in Derbyshire, though it will not stand comparison with those on Salisbury Plain. It consists of a huge circle 167ft. in diameter of large rough stones, surrounded by a ditch

Week-end and Touring Notes (Continued).

and rampart. It stands on elevated ground amidst desolate and lonely country. The stones vary from 12ft. by 5ft. by 7ft. to smaller ones 5ft. or 6ft. long. What Arbor Low was can no more be stated with certainty than Stonehenge. It may be the work of the Romans, the Ancient Britons, or the Druids. It may have been a tomb

lonely spot. In coaching days, however, the Newhaven Inn, as it is named, was the best known house in all the county, and could stable a hundred horses, and it was badly needed, for the road between Buxton and Ashbourne was a lonely one, and the Duke of Devonshire did well to erect this house for the travellers' com-



Nature's Arches, Dovedale.

or a temple, a place of sacrifice, or a priestly rendezvous—nothing is certain. The word Low, by the way, often come across in Derbyshire, is derived from the Saxon hlou or dhlou, meaning a hill, generally a burial place of chieftains; as corrupted it is very misleading. Tradition says that on Hartington Moor, near Arbor Low, once occurred a sanguinary battle between Britons and Romans.

A little farther south at a fork of the main road is a three-storeyed inn of such a large size as to cause surprise in this

(To be continued.)

Flashes (Continued).

The City Ignition Company advise us that they have removed to larger premises situated at 359, Goswell Road, London, E.C.

The White and Poppe carburetter has been awarded a grand diploma of honour at the Turin International Aviation Exhibition.

Mr. Bernard Steeley, commercial managing director of Joseph Lucas, Ltd., Birmingham, is leaving England on the 21st inst. for a business and pleasure tour in Canada. He will go direct to Montreal, which city will be his headquarters. Mr. Steeley expects to return to England in about a month's time.

Mr. Norman C. Seeman, consulting engineer, of Norwich Union Building, 59, St. James's Street, Piccadilly, London, W., informs us that he has turned his business into a limited liability company under the title of Messrs. Seeman and Stones, Ltd., and that this business will continue to be carried on at the above address.

fort. It is now as quiet as it was then gay. King George IV. once spent a night here, and was so satisfied with the entertainment he enjoyed that he granted it a free and perpetual licence.

Alsop-en-le-Dale is a tiny picturesque village lying in a dale. It has a little Norman church which was well worth attention before it was "restored." Alsopps, the famous Burton brewers, came from this village. It forms the starting point for a walk through Dovedale, the loveliest dale in all the length and breadth of England.

We are informed that the price of the 12-15 h.p. Sizaire-Naudin car is £350 and that the tyres are Continentals.

At the Shelsley-Walsh Hill-climb, the cars which won the president's cup and the club cup for the fastest time in the open event and the open handicap, were fitted with Stewart-Precision carburetters. At the Aston Hill-climb, the Jay cup for the best performance by a private owner driving his own car was won by a car fitted with a Stewart-Precision carburetter.

A new garage is being built at Lewes at the corner of School Hill and Friars Walk, for Messrs. Wallace and Ashby, who hold the sole agency for Sussex for De Dion Bouton cars. The new garage has a vulcanising plant, accumulator charging installation, etc. The De Dion Bouton agency was formerly held by Messrs. Sidley and Wallace, but on the retirement of Mr. Sidley, Mr. Wallace took into partnership Mr. W. H. Ashby, of Brighton.



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